

**IN THE UNITED STATES DISTRICT COURT  
FOR THE EASTERN DISTRICT OF TEXAS  
MARSHALL DIVISION**

**ADVA OPTICAL NETWORKING NORTH  
AMERICA, INC. and ADVA OPTICAL  
NETWORKING SE,**

**Plaintiff,**

**vs.**

**HUAWEI TECHNOLOGIES CO. LTD.,**

**Defendant.**

**Civil Action No. 2:23-cv-201**

**JURY TRIAL DEMANDED**

**ORIGINAL COMPLAINT**

Plaintiffs ADVA Optical Networking North America, Inc. (“ADVA NA”) and ADVA Optical Networking SE (“ADVA SE”) (collectively “ADVA” or “Plaintiffs”) file this Original Complaint against Defendant Huawei Technologies Co. Ltd. (“Huawei” or “Defendant”) and allege as follows:

**NATURE OF ACTION**

1. ADVA, a leading provider of network equipment for data, storage, voice and video services brings this lawsuit, in part, based on Huawei’s failure to offer a license to its alleged standard essential patents (“SEPs”) on fair, reasonable, and non-discriminatory (“FRAND”) terms and conditions in breach of contractual obligations Huawei made through participation in the Telecommunication Standardization Sector of the International Telecommunication Union (“ITU-T”).

2. ADVA is a willing licensee and seeks to pay a RAND and/or FRAND (hereinafter FRAND) royalty for a license to the alleged ITU-T optical transport network (“OTN”) and

Datacom (“DC”) SEPs owned or controlled by Huawei. Accordingly, ADVA seeks a declaration of its rights and Huawei’s obligations, breach of contract and other violations of law, as well as the determination and imposition of the FRAND terms and conditions for a worldwide license to the alleged OTN and DC SEPs owned or controlled by Huawei. As referred to herein, the OTN and DC SEPs are the 514 patents Huawei identified to ADVA in the PLA discussed below.

3. Huawei purports to own patents that have been declared essential to the ITU-T standards that are implemented by the products ADVA designs, manufactures and sells in the United States, Texas and/or the Eastern District of Texas. Having been declared as essential to these standards as Huawei claims, the patents are encumbered, under the ITU-T’s Intellectual Property Rights (“IPR”) Policies, and thus must be licensed on FRAND terms and conditions to all potential implementers of the standards, such as ADVA. The ITU-T relied on Huawei’s FRAND commitments in incorporating the technology of the patents now owned or controlled by Huawei into the relevant standards.

4. Huawei has participated in the ITU-T standardization processes and has submitted declarations promising to license its intellectual property rights related to the ITU-T standards owned by it and/or its affiliates on FRAND terms and conditions.

5. The ITU-T and other SSOs require FRAND commitments in recognition of the dangers inherent in collective standard-setting activities, which eliminate competitive technological alternatives that otherwise would have existed in the market. Once standardized, a technology is “locked-in” and must be practiced by all who wish to produce standard-compliant products. Such lock-in gives SEP owners the market power to exclude companies from practicing the standard and to raise the cost of practicing the standards by charging supra-competitive royalties in excess of the *ex-ante* value of such technology when it still competed with alternatives.

This phenomenon is often referred to as “hold-up.” Such market power does not derive from the original patenting of the SEPs at issue, but results directly from collective action. Having its proprietary technology included in the standards enables the SEP owner to license a much greater volume of products than would be the case if the technology was not used in the standards. To ameliorate the risks posed by, and as a trade-off for this market power, the SEP owner is required to make the FRAND licensing commitment by SSOs like the ITU-T.

6. As a supplier of products implementing various OTN and DC standards, ADVA is a third-party beneficiary of Huawei’s and numerous other SEP holders’ FRAND promises to the ITU-T. Relying on these FRAND promises, ADVA invested significant resources to develop products that practice the relevant standards, including in the United States and the Eastern District of Texas.

7. Huawei’s royalty demands for a patent license violate its FRAND commitments, including, but not limited to, by:

- Attempting to seek grossly excessive or supra-competitive royalties from ADVA for a license to its alleged OTN and DC SEPs; and
- Demanding ADVA pay royalties for patents that are, in fact, not essential to the ITU-T standards; and
- Bundling essential and non-essential patents, and demanding ADVA pay royalties for patents for which ADVA does not require a license.

8. ADVA is a ready and willing licensee, as long as the terms and conditions are consistent with Huawei’s FRAND commitments to which ADVA is a beneficiary. Unfortunately, Huawei is refusing to negotiate in good faith with ADVA for such a license. On information and belief, Huawei’s knowing misrepresentations, refusal to provide necessary information to ADVA

in a timely manner, and failure to comply with its FRAND obligations are part of a conspiracy by Huawei and its worldwide affiliates, in conjunction with the Chinese government, to wrongfully dominate and control the market for telecommunications equipment.

9. As a result, ADVA has no choice but to bring this lawsuit to address the above breach of contract and other violations of law, and to obtain a license on behalf of itself and all of its worldwide affiliates who require such a license to the OTN and DC SEPs owned or controlled by Huawei on FRAND terms and conditions.

10. During negotiations, Huawei also attempted to obtain grossly excessive royalties by compelling ADVA to license patents that ADVA does not infringe. Accordingly, ADVA also seeks a declaratory judgment of non-infringement of U.S. Patent Nos. 9,225,462 (“the ’462 patent”), 11,233,571 (“the ’571 patent”), 9,564,973 (“the ’973 patent”), 10,164,728 (“the ’728 patent”), and 9,528,907 (“the ’907 patent”) arising under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.* and the patent laws of the United States, 35 U.S.C. § 100 *et seq.*

11. ADVA also brings an action for infringement of its United States patent arising under 35 U.S.C. §§ 271, 281, and 284–85, among others.

### **THE PARTIES**

12. Plaintiff ADVA Optical Networking North America, Inc. is a Delaware corporation with its principal place of business at 5755 Peachtree Industrial Boulevard, Norcross, Georgia 30092-3502. Plaintiff ADVA NA has offices in Texas at 2301 Greenville Avenue, Richardson, Texas 75082.

13. Plaintiff ADVA SE is a *Societas Europaea* organized under the laws of the European Union, with a principal place of business located at Fraunhoferstraße 9a, 82152 Martinsried/Munich, Germany. Plaintiff ADVA NA is a subsidiary of Plaintiff ADVA SE.

14. As a result of a recent transaction, ADVA SE is majority owned and controlled by Adtran Holdings, Inc. (“Adtran Holdings”), a Delaware corporation with its principal place of business at 901 Explorer Boulevard, Huntsville, Alabama 35806-2807. In combination with Adtran Holdings’ U.S. subsidiary Adtran, Inc. (“Adtran”), the companies create a leading global, scaled provider of end-to-end fiber networking solutions for communications service provider, enterprise, and government customers.

15. ADVA develops innovative Optical and Ethernet-based networking solutions for telecommunications carriers and enterprises to deliver data, storage, voice and video services. ADVA invests significant resources in research and product development in the United States and abroad as well as acquires and integrates complimentary technologies. ADVA’s efforts have resulted in ADVA obtaining over 228 patents in the United States and 569 patents worldwide, including U.S. Patent No. 8,280,249.

16. Plaintiff ADVA NA leads global research and development for certain ADVA products at issue from its Norcross, Georgia facility. ADVA’s OTN and Ethernet-based networking research and product development occurs in the United States, with OTN research and development occurring, among other places, in its Norcross, Georgia facility. Research and development for ADVA’s Ethernet-based networking products, which Huawei’s DC SEPs implicate, occurs, among other places, in its Richardson, Texas facility.

17. Plaintiff ADVA NA’s Richardson, Texas facility employs over 100 personnel, including over 50 personnel in research and development, engaged in developing, producing, selling and distributing Optical and Ethernet-based networking solutions to telecommunications carriers and enterprises to deliver data, storage, voice and video services. Personnel from this Richardson, Texas office are directly involved in, among other things, the research, development

and sale of ADVA products implicated by this Complaint and Huawei's breach of its FRAND commitments and anticompetitive and fraudulent behavior relating to ADVA's products.

18. ADVA sells, offers for sale, services and/or ships products to customers in Texas and in this District, including, for example, ADVA's FSP 3000 and FSP 150. ADVA personnel responsible for the design and development of these products are located in the United States, and ADVA research and development is led from the U.S. and occurs in Texas, among other places. ADVA personnel responsible for the sales and marketing of such ADVA products are located in the U.S., including Texas. Huawei claims that ADVA's FSP 3000 and FSP 150 and other ADVA products practice one or more ITU-T standards. During negotiations, Huawei claimed these products infringe one or more of the Huawei patents, including Huawei patents identified in this Complaint. Huawei has declared each Huawei patent identified in the Complaint as essential to the ITU-T.

19. On information and belief, Defendant Huawei is a limited liability company with its principal place of business at Bantian, Longgang District, Shenzhen 518129, People's Republic of China. On information and belief, Defendant Huawei is a wholly-owned subsidiary of Huawei Investment & Holding Co., Ltd., which is based in the People's Republic of China. The People's Republic of China is a signatory to the Hague Service Convention, and Defendant Huawei may be served through the Central Authority in that country.

20. On information and belief, Defendant Huawei is part of a multinational conglomerate that operates itself and its subsidiaries or affiliates (including Huawei Technologies USA, Inc. ("Huawei USA") and Futurewei Technologies Inc. ("Futurewei"). Huawei USA is a Texas corporation with its principal place of business at 16479 Dallas Parkway, Suite 355, Addison, Texas 75001-3586. Futurewei is a Texas corporation having offices at 15851 Dallas

Parkway, Suite 650, Addison, Texas 75001-7517. On information and belief, Defendant Huawei directly or indirectly controls each of its subsidiaries or affiliates, including Huawei USA and Futurewei, and the presence and acts of those two entities are attributable to Huawei.

21. As detailed more fully below, the United States government has indicted Huawei in the Eastern District of New York for violation of several provisions of the U.S. Code. The indictment alleges that the principal purpose of the Huawei Enterprise, defined below, “was to grow the global ‘Huawei’ brand into one of the most powerful telecommunications equipment and consumer electronics companies in the world by entering, developing and dominating the markets for telecommunications and consumer electronics technology and services in each of the countries in which the Huawei Enterprise operated.” The Huawei Enterprise operated, according to the indictment, in a number of districts around the country, including the Eastern District of Texas.

22. On information and belief, Defendant acted in concert with respect to the facts alleged herein such that any act of any other Huawei entity mentioned herein is attributable to Huawei and vice versa. Further, on information and belief, the acts of any U.S. Huawei entity, including Huawei USA and Futurewei, are alter egos of Huawei, with Huawei conspiring with and directing and controlling the actions of those entities.

#### **JURISDICTION AND VENUE**

23. This Court has subject matter jurisdiction over each alleged non-infringement and infringement claim under 28 U.S.C. §§ 1331 and 1338(a) as these claims arise under the United States patent laws. This Court has subject matter jurisdiction over the other claims under 28 U.S.C. §§ 1331 and 1338(a), (b). This Court also has supplemental jurisdiction over those other claims pursuant to 28 U.S.C. § 1337(a) because those other claims form part of the same case or

controversy as the federal claims. This Court may grant declaratory and injunctive relief in this action pursuant to at least 28 U.S.C. §§ 2201 and 2202.

24. This Court has general and specific personal jurisdiction over Huawei pursuant to due process and/or the Texas Long Arm Statutes. Huawei has continuous and systematic business contacts with the State of Texas that subject it to the Court's personal jurisdiction.

25. Huawei is subject to this Court's specific and general personal jurisdiction due at least to Huawei's substantial business in Texas and this District, including but not limited to (i) regularly doing or soliciting business, engaging in other persistent courses of conduct, or deriving substantial revenue from goods and services provided to individuals in Texas and in this District, (ii) committing the alleged infringement in Texas and this District.

26. Huawei has conducted substantial business in Texas and intends to continue to do so, directly or through intermediaries, and has offered its products or services, including those accused herein of infringement, to customers located in Texas, including in this District.

27. Through its corporate parent, subsidiaries and affiliates (including Huawei USA and Futurewei), Huawei has engaged a plan to dominate the market for telecommunications technology and services throughout the globe and particularly in this District. Huawei, along with Futurewei and, on information and belief, Huawei USA, engaged and continues to engage in activities to extort non-FRAND rates for its alleged SEPs.

28. Faced with allegations and regulatory restrictions in the U.S., Huawei has expanded its business to include licensing its patents as a source of revenue to replace lost U.S. sales revenue. *See, e.g.,* <https://www.cnbc.com/2023/02/06/huawei-turns-to-patents-for-a-lifeline-including-those-in-the-us.html>; <https://tech.hindustantimes.com/tech/news/huawei-files-a-173-page-lawsuit-against-verizon-story-opZYBUqmvDbWTOLEknbZuO.html>.

29. On information and belief, Huawei is engaged in, or has engaged in, patent licensing negotiations and discussions with U.S. companies, including companies with offices in Texas, and seeking exorbitant royalty payments.

30. Huawei maintained its North American headquarters in Plano, Texas at 5700 Tennyson Pkwy, Suite 600, Plano, Texas 75024, for many years.

31. On information and belief, Huawei has employed and contracted with individuals who reside and work within this District and Texas, committed acts of infringement in this District and Texas, formed part of the Huawei Enterprise in this District and Texas, operated the Huawei Enterprise within this District and Texas, and continues to do so.

32. Huawei operates in the U.S. individually and through its control of Huawei USA and Futurewei, which are Texas corporations with a principal place of business and offices, respectively, in Addison, Texas. Additionally, ADVA SE, on behalf of ADVA NA which is located in Texas, has been involved in attempting to obtain FRAND royalties for a license to Huawei's alleged SEPs. Thus, this lawsuit arises out of Huawei's contacts with Texas with respect to its FRAND commitments, its failure to offer FRAND royalties to ADVA SE and ADVA NA, its hold-up negotiation tactics, unfair acts and fraud related thereto.

33. Further, Huawei committed, induced, and contributed to acts of infringement from the District and within the District. On information and belief, Huawei has made, used, sold, offered to sell, and/or imported equipment into Texas and this District that infringes ADVA's patent.

34. Huawei has committed acts directed at the Eastern District of Texas giving rise to this action and has established sufficient minimum contacts with the State of Texas such that the exercise of jurisdiction would not offend traditional notions of fair play and substantial justice.

The facts described herein demonstrate that Huawei is subject to personal jurisdiction in this Court based on its activities directed to this District.

35. Alternatively, the facts alleged above demonstrate that Huawei is subject to personal jurisdiction in this Court at least pursuant to Fed. R. Civ. P. 4(k)(2).

36. Venue is proper in this district pursuant to 28 U.S.C. §§ 1400(b) and 1391(b), (c). Venue is proper against Huawei because venue is proper in any judicial district against a foreign corporation. Venue is also proper because Huawei maintained a regular and established place of business in this district and committed acts and continues to commit acts of infringement in this district.

37. Huawei has previously, on a number of occasions, consented to jurisdiction in this District and availed itself of the benefits and protections afforded by the court system in this District by bringing suit against U.S. defendants related to its essential and non-essential patents on multiple occasions. *See, e.g., Huawei Technologies Co. Ltd. vs. T-Mobile US, Inc. et al.*, Case No. 2:16-CV-00715; *Huawei Technologies Co. Ltd. vs. Verizon Communications, Inc. et al.*, Case No. 2:20-CV-0030 (involving, on information and belief, patents from Huawei's OTN and DC SEP portfolios that Huawei seeks to license to ADVA and allegations regarding Huawei's breach of its FRAND obligation to the ITU-T, further demonstrating that Huawei's unfair acts with regard to ITU-T have occurred in this District).

38. Huawei's breach of its contractual FRAND commitments, fraud, and acts of unfair competition are related to and involve a common nucleus of operative facts with ADVA's claims seeking a declaration of non-infringement and non-essentiality of Huawei's patents and result from Huawei's allegations of infringement and failure to provide a FRAND license for its purportedly standard essential patents as well as Huawei's infringement of ADVA's patent.

## **FACTUAL BACKGROUND**

### **A. Standard-Setting Organizations**

39. Standards-setting organizations (“SSOs”) are organizations established to, among other things, develop, institute, and disseminate technical standards and specifications in various industries. SSOs in the communications and networking industries include, for example, the ITU-T. Technical specifications and standards for communications technologies are often developed through the efforts of SSOs and their membership to establish specifications (or recommendations) that allow for seamless interconnectivity of devices in a particular technology such as Optical and Ethernet-based networks. These networks are based on technologies and standards developed through SSOs and adopted, at least in part, by industry participants. SSOs implement policies and procedures to control the disclosure and licensing of patents held by their members and that may read on adopted standards and/or those being developed. These policies and procedures are set out in each SSO’s intellectual property rights policies (“IPR policies”) and/or in declarations pursuant to those policies.

40. In order to reduce the likelihood that implementers of standards will be subject to abusive and anticompetitive practices by patent holders, SSOs have adopted rules, policies and procedures that address the disclosure and licensing of patents that SSO participants may assert are essential to the implementation of the standard under consideration. These rules, policies and/or procedures are set out in the IPR policies of the SSOs.

41. These policies and/or undertakings pursuant to those policies constitute contractual commitments to offer standard-essential patents in accordance with the terms of those policies. Such SSO IPR policies and undertakings can include, among other things, an obligation to license patents declared standard essential on FRAND terms and conditions. As detailed herein, the

ITU-T's IPR policy obligates members to grant irrevocable licenses to essential patents on FRAND terms and conditions.

42. Technical standards play a critical role in the development of optical networking. In general, technical standards—such as those for optical networking—have the potential to encourage innovation and promote competition among equipment suppliers and network providers.

43. The technical specifications for most standards are published and broadly available. Product designers and manufacturers are thus willing to invest heavily in the development of networks or component parts because, so long as their products are compliant with the published technical standard, those products will operate effectively within the networks and be compatible with other products from third parties.

44. Standards development also reduces costs for both suppliers and purchasers. For suppliers, standardization reduces the need, in many instances, to develop products to a particular purchaser's specifications. Accordingly, because a single product or product line may be sold to multiple purchasers and distributed more widely, manufacturing volumes increase and per unit of costs decrease. Purchasers benefit from increased price competition among suppliers.

## **B. ITU-T Common Patent Policy and FRAND Commitments**

45. The ITU-T Common Patent Policy states, in relevant part:

1 The ITU-T Telecommunication Standardization Bureau (TSB), the ITU Radiocommunication Bureau (BR) and the offices of the CEOs of ISO and IEC are not in a position to give authoritative or comprehensive information about evidence, validity or scope of patents or similar rights, but it is desirable that the fullest available information should be disclosed. Therefore, any party participating in the work of ITU-T, ISO or IEC should, from the outset, draw the attention of the Director of ITU-TSB, the Director of

ITU-BR, or the offices of the CEOs of ISO or IEC, respectively, to any known patent or to any known pending patent application, either their own or of other organizations, although ITU-T, ISO or IEC are unable to verify the validity of any such information.

2 If a Recommendation | Deliverable is developed and such information as referred to in paragraph 1 has been disclosed, three different situations may arise:

2.1 The patent holder is willing to negotiate licenses free of charge with other parties on a non-discriminatory basis on reasonable terms and conditions. Such negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC.

2.2 The patent holder is willing to negotiate licenses with other parties on a non-discriminatory basis on reasonable terms and conditions. Such negotiations are left to the parties concerned and are performed outside ITU-T/ITU-R/ISO/IEC.

2.3 The patent holder is not willing to comply with the provisions of either paragraph 2.1 or paragraph 2.2; in such case, the Recommendation | Deliverable shall not include provisions depending on the patent.

3 Whatever case applies (2.1, 2.2 or 2.3), the patent holder has to provide a written statement to be filed at ITU-TSB, ITU-BR or the offices of the CEOs of ISO or IEC, respectively, using the appropriate “Patent Statement and Licensing Declaration” form. This statement must not include additional provisions, conditions, or any other exclusion clauses in excess of what is provided for each case in the corresponding boxes of the form.

The Patent Statement and Licensing Declaration Form for ITU-T or ITU-R Recommendation | ISO or IEC Deliverable requires a declarant to identify the Number and Title of the Deliverable.

46. The Patent Statement and Licensing Declaration Form for the ITU-T requires a “Patent Holder” to identify either: 1) that it is “prepared to grant a Free of Charge license to an unrestricted number of applicants on a worldwide non-discriminatory basis and under other reasonable terms and conditions to make, use, and sell implementations of the above document[,]” 2) that it “is prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the above document[,]” or 3) that it “is unwilling to grant licenses in accordance with provisions of either 1 or 2 above.”

47. If a participant in an ITU-T working group states that it is unwilling to grant licenses to patents identified in the General Patent Statement or Patent Statement and Licensing Declaration Form, the working group will revise the standard so that compliance can be achieved without facing any potential issues relating to such patent(s) or discontinue work on the standard altogether.

48. The reason for the ITU-T’s policies and rules is, among other things, to permit innovators to invest in and bring to market new products that comply with the industry standards with confidence that holders of declared-essential patents will not abuse the monopolistic positions that have been conveyed on them through the standardization process.

### C. Huawei’s FRAND Commitments to the ITU-T

49. On information and belief, Huawei participated in the development and implementation of industry standards through their membership and participation in SSOs, such as the ITU-T. Huawei undertook specific obligations to the ITU-T to license its intellectual

property on FRAND terms and conditions. Huawei, including its related entities, affiliates, and successors- and predecessors-in-interest, are obligated by these FRAND commitments.

50. Huawei and/or its predecessors entered into express and/or implied contracts with the ITU-T's members or, alternatively, with the ITU-T, to which the ITU-T members and others are third-party beneficiaries. By participating in the ITU-T, Huawei agreed, among other things, to abide by the ITU-T's policies and rules and Huawei's Patent Statements to the ITU-T.

51. Huawei and/or its predecessors made an irrevocable guarantee to the ITU-T on multiple occasions to grant FRAND licenses to its SEPs. To date, Huawei and/or its predecessors appear to have filed 170 patent statements all with similar language regarding its FRAND contractual obligation that Huawei is now refusing to abide by. For example, Huawei's General Patent Statement provides, "The Patent Holder is prepared to grant—on the basis of reciprocity for the relevant ITU-T Recommendation(s)—a license to an unrestricted number of applicants on a worldwide, nondiscriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the relevant ITU-T Recommendation(s)." *See* September 8, 2006 letter from Yan Xin, IP Manager at Huawei Technologies Co., Ltd., to Director of ITU-T.

52. Huawei and/or its predecessor made similar representations in specific Patent Statement and Licensing Declarations filed under OTN standards, including G.709/Y.1331 (December 10, 2008; December 23, 2011; April 23, 2012; March 13, 2018), G.709.1 (October 18, 2016), G.7042 (February 15, 2006), G.7044 (August 23, 2011), G.873.2 (September 17, 2014), G.Sup 56 (March 13, 2018), and G.Sup 70 (February 8, 2022), with the date in the parenthesis indicating the date of the statement. For example, Huawei declared that "[t]he Patent Holder is prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations

of the above document [referring to the ITU-T Recommendation number cited in the applicable Patent Statement and Licensing Declaration].”

53. Huawei and/or its predecessor made similar representations in specific Patent Statement Licensing Declarations filed under DC standards, including G.8032 (July 12, 2011), G.8264 (April 13, 2018), G.8275.1 (April 12, 2019 and February 8, 2022), and G.Sup 68 (March 12, 2020), with the date in the parenthesis indicating the date of the statement. For example, Huawei declared that “[t]he Patent Holder is prepared to grant a license to an unrestricted number of applicants on a worldwide, non-discriminatory basis and on reasonable terms and conditions to make, use and sell implementations of the above document [referring to the ITU-T Recommendation number cited in the applicable Patent Statement and Licensing Declaration].”

54. Huawei’s patents, including the OTN and DC patents, are FRAND-encumbered based on these general and specific Patent Statements. Huawei is therefore bound by its commitment to provide licenses and negotiate in good faith with third parties, including ADVA, on FRAND terms.

55. ADVA invested substantial resources in developing products in compliance with ITU-T standards, including the OTN and DC standards. ADVA and other implementers of the OTN and DC standards rely on participants in the development of the OTN and DC standards to submit a Patent Statement and Licensing Declaration Form and identify any patents they do not commit to license Free of Charge or on FRAND terms and conditions.

56. ADVA necessarily relied on Huawei and other patent holders’ participation in the development of the OTN and DC standards that licenses would be available to any essential patents held by patent holders and their assignees on FRAND terms. ADVA and other implementers of the OTN and DC standards rely on the integrity of the standard development process, including

the submission of FRAND Patent Statements, in order to ensure that they may implement standards by licensing any essential patents without risk of litigation and on FRAND terms and conditions.

57. Huawei claims its patents are essential, and to the extent Huawei's patents are essential to the standard, Huawei is obligated to provide ADVA with a license under FRAND terms and conditions as required by the ITU-T and has failed and/or refused to do so. Huawei's and/or its predecessors' irrevocable promises to the ITU-T, on information and belief, were not made in good faith and constitute misrepresentations to the ITU-T, and such actions constitute standard-setting misconduct.

58. As a result of Huawei's contractual breach, ADVA has been injured in its business or property, and is threatened by imminent loss of profits, loss of customers and/or potential customers, and/or loss of goodwill and product image, including time and expense in negotiation with Huawei.

#### **D. FRAND License Negotiations and Huawei's Obligations Generally**

59. Because Huawei has asserted that its patents are "essential," companies like ADVA that relied on Huawei's commitments are entitled to receive the benefit of a FRAND license. As Huawei recognized in its 2012 litigation with InterDigital, "a FRAND obligation requires more than good faith efforts, and actually requires a SEP holder to grant FRAND licenses."

60. FRAND obligations are important to the FRAND ecosystem because, in the process of developing standards, participants choose particular technology to provide each individual function within the standard. Participants evaluate whether to standardize particular proposed functionalities and, if so, which viable, alternative competing technologies to select to perform those functionalities. Once a standard is adopted, the viability of using alternative technologies is eliminated. Standardization thus eliminates as substitutes all the technologies that were capable of performing the functionality in the standard but that were not chosen to be included. Parties

supplying products that support a standard, like ADVA, thus become “locked-in” to the standardized technology.

61. To the extent Huawei is correct that its patented technologies have been incorporated into standards, Huawei has the power to raise prices and exclude competition with respect to each of the technologies covered by its patents and incorporated in the relevant standard, particularly if it does not satisfy its contractual obligation to negotiate in good faith a FRAND license. Huawei possesses “hold-up” power because, without a license, a party using the standard risks the threat of an injunction that could put its entire business at risk. Moreover, because many companies often contribute to the standard-setting process, the agreement to provide FRAND license terms is important because supra-competitive rates, when contemplated in the scenario of numerous potential licensors for a standard, would significantly damage the ability of implementers, like ADVA, to provide necessary products, thus harming societal interests and the economy.

62. This hold-up power can be exacerbated when a company like Huawei has amassed a large portfolio of patents. By refusing to license claimed-essential patents individually and engaging in serial litigation tactics and “all-or-nothing” approaches to proposed licensing, companies like Huawei can heighten the hold-up threat of SEPs and violate the premise of a FRAND obligation. When non-FRAND terms and conditions are proposed, and a party like Huawei refuses to engage in the “give and take” negotiation process contemplated by FRAND, a would-be licensee is faced with the prospect of either acceding to non-FRAND, portfolio-wide demands or risking serial litigation and an injunction crippling its business. Left unconstrained, owners of SEPs can take advantage of lock-in and demand exorbitant royalties and other terms.

63. FRAND policy thus seeks to prevent this “hold-up” power of a SEP holder. FRAND policy and the fairness enveloping that policy ensures that a SEP holder cannot dominate the market and companies that are “locked-in” can continue their business under fair and reasonable terms.

64. The commitment to fair and non-discriminatory licensing is enhanced by critical transparency requirements concerning the applicable licensing conditions that exist for the parties. Throughout the FRAND negotiation process, both parties should negotiate transparently and in good faith based on an exchange of relevant information. Because the royalty must be “non-discriminatory” as well as fair and reasonable, the SEP holder should disclose to the implementer information about existing licenses with other licensees it claims are “comparable” and support its alleged FRAND royalty with actual facts that can be fairly analyzed by proposed licensees.

65. Here, Huawei’s concealment of its true intention not to offer FRAND terms and conditions to all those implementing the standard—despite its prior written commitments to the contrary—induced the ITU-T to standardize each technology that Huawei claims is covered by Huawei’s OTN and DC SEPs. Had Huawei disclosed its true intention not to offer FRAND license terms for each of the OTN and DC SEPs, the ITU-T would not have standardized the input technologies that Huawei now claims to be covered. Rather, the ITU-T would have decided (a) to standardize an alternative technology to perform the relevant function or (b) to continue to leave the relevant function out of the standard, in which case implementers would have been free to choose various alternative technologies to perform that function.

#### **E. Huawei’s Refusal to Offer FRAND License Terms for Its Patents**

66. Since the commencement of licensing negotiations between Huawei and ADVA, ADVA has repeatedly asked Huawei to provide basic information necessary for ADVA to determine whether any rate that Huawei quotes is in fact, fair, reasonable, and non-discriminatory,

including (a) the royalty base to which Huawei contends the FRAND royalty rates would apply, (b) any evidence that other companies are also paying comparable royalty rates to those Huawei demands from ADVA, and (c) copies or summaries of license agreements with comparable companies.

67. Rather than negotiate in good faith, the only offer that Huawei has made with respect to the OTN and DC SEPs did not comply with its FRAND obligations. Despite repeated requests, Huawei refused to provide ADVA any information about any potentially relevant license agreements with other companies, which would allow ADVA to determine whether any future Huawei offers are in fact FRAND (no such information is necessary to determine that Huawei's only offer thus far is not FRAND).

68. On information and belief, Huawei has not filed suit against other implementers of optical networks, even though many such implementers do not have a license from Huawei to practice Huawei's OTN and DC SEPs. Instead, Huawei is singling out ADVA on a discriminatory basis in violation of its licensing declarations and FRAND obligations.

69. Huawei first sent ADVA a letter on May 16, 2022. This letter purports to "invite ADVA to engage licensing discussion with Huawei" regarding "Optical Transport Network, Internet Protocol and data communication technologies."

70. Huawei's May 16 letter further stated that Huawei held over 110,000 patents by the end of 2021 and included a lengthy laundry list of Huawei patents and did not identify the relevance of those patents to any ADVA product or standard.

71. Huawei's May 16 letter also offered to "present additional information to [ADVA] regarding the license available from Huawei upon the execution of a mutual nondisclosure agreement." Huawei concluded by asking for a response by June 16, 2022.

72. On June 15, 2022, ADVA wrote to Huawei and explained that it is a company that invests heavily in its own R&D, and further indicated that a face-to-face discussion would be helpful in order to “better understand if there is a possibility that one of our companies’ products implements any of Huawei’s patented technologies.” ADVA asked Huawei whether it would like to meet and put a non-disclosure agreement (NDA) in place.

73. After ADVA’s invitation to meet, Huawei and ADVA exchanged several scheduling emails. Huawei also sent a draft NDA for consideration on June 30, 2022. ADVA and Huawei then agreed to meet on August 2, 2022.

74. Prior to the August 2, 2022 meeting, ADVA sent Huawei a revised NDA to correct, *inter alia*, the contracting parties and to add Huawei’s German entity, whose employees were actively involved in the licensing discussions. Huawei immediately rejected ADVA’s revised NDA.

75. At the August 2, 2022 meeting, Huawei presented a PowerPoint titled “Introduction for Licensing Discussion.” Huawei claimed in the presentation to be “a primary contributor in the development of optical and data communication standards including ITU-T, IEEE, OIF, etc.,” and Huawei also claimed that it had “obtained extensive patent portfolios essential to these standards.” Huawei then listed several ADVA products that Huawei alleged were covered by Huawei patents and told ADVA that claim charts “are available for all the 440 granted/allowed ITU SEPs”; for “all the 74 granted/allowed OIF SEPs”; and for “all the 18 granted/allowed IEEE SEPs.”

76. Huawei then provided what it claimed was a FRAND offer supported only by a cursory chart containing no specifics or information that could allow the proposed rate to be analyzed. Huawei demanded royalty rates for its OTN and DC SEPs relating to certain ITU-T standards that were separately and collectively exorbitant.

77. Huawei claimed these rates were appropriate based on the non-comparable, cellular industry. In the presentation, Huawei also purported to identify comparable rates from unidentified licensors in vague and high-level technical areas of SDH/SONET, GFP, RPR, PLS, GMPLS, and/or RSVP-TE. Huawei did not provide any information regarding who the Licensors are, how this technology is comparable, what specific products were covered by the licenses, or how the FRAND rate proposed based on these alleged comparable rates is fair and reasonable for ADVA and the OTN and DC technology.

78. During the August 2022 presentation, Huawei also identified ADVA products compliant with several communication standards other than ITU-T standards. But the presentation was unclear whether Huawei intended to consider ADVA's products compliant with these standards and licensed under its proposed FRAND rate; it appears this was not Huawei's intent.

79. A few weeks after the August 2, 2022 meeting, Huawei sent ADVA 30 "exemplary" claim charts (not the complete set of 532 claim charts it claimed to have).

80. Huawei claimed that 22 of the exemplary charts identified OTN SEPs that read on ITU-T standards—EP1850536, EP2148476, EP2154833, EP3116193, EP2296297, EP2680469, US9225462, EP2429118, CN101729370, EP1737147, EP2237457, EP2434712, EP2978149, EP3322111, EP2733880, EP2854417, EP3627727, EP3297196, EP3285444, EP3343805, US11245491 and US11233571. Huawei further represented that its OTN SEPs are essential to at least the G.7042, G.873.2, G.7044, G.709/Y.1331, G.709.1, G.7044, G.Sup 56, and G.Sup 70 standards established by the ITU-T.

81. Huawei claimed that 8 of the exemplary charts identified DC SEPs—EP2178251, EP2086175, EP2182670, CN200710151946.8, EP2800287, EP2897312, CN201910844122.1 and

202010023012.1. Huawei further represented that the DC SEPs are essential to at least the G.8032, G.8264, G.8275.1, and G.Sup 68 standards established by the ITU-T.

82. While Huawei requested ADVA to conduct a piecemeal analysis of the claim charts for discussion, ADVA informed Huawei in an October 4, 2022 email that it would prefer to discuss all of the charts at once. ADVA suggested a meeting or call in November of 2022 and also offered to share information about ADVA patents that Huawei might need to license as part of a global resolution between the companies. ADVA also told Huawei that it would like to get an agreed NDA in place before the meeting and offered to address the open questions that Huawei had regarding the NDA. In response, Huawei inexplicably continued to refuse to sign an NDA.

83. ADVA and Huawei had another meeting on November 17, 2022. ADVA informed Huawei that after a preliminary analysis of Huawei's claim charts, most were not used by ADVA and the remaining are invalid. ADVA also provided Huawei with 10 exemplary ADVA patents relevant to Huawei's OTN and DC products. ADVA agreed at the meeting to provide a short, exemplary analysis of one of the Huawei patents that is invalid, which it sent to Huawei on January 30, 2023. The parties then conducted a meeting on February 1, 2023.

84. Due to Huawei's continued refusal to include one of its entities negotiating with ADVA in the NDA, the parties still had not executed an NDA moving into 2023. Still, ADVA and Huawei agreed to meet again in early 2023 and targeted the next meeting in early March so that ADVA could present a counteroffer to Huawei. Due to an unexpected illness to ADVA's lead negotiator, the parties postponed the meeting to the end of March.

85. Prior to the scheduled March 30, 2023 meeting, ADVA contacted Huawei by email on March 28, 2023 and confirmed that it "is willing to take a license to [Huawei's] standard essential patent portfolio at any terms that are in fact FRAND." ADVA further confirmed its "aim

is to take a global patent license for our products on fair, reasonable and non-discriminatory terms the sooner the better.” But ADVA informed Huawei that in preparing a counteroffer, “it appeared that some information you provided is not clear or still missing.” ADVA, therefore, requested clarity on several issues.

86. ADVA requested clarification of the Licensed Standards and Licensed Product definitions from the August 2, 2022 presentation. ADVA further requested that, to better understand Huawei’s offered royalty rates, Huawei clarify the royalty rates in the presentation and explain “whether the list is complete in that it covers all licensees that Huawei has ever licensed its OTN, Data Communication, and other comparable SEPs or patent portfolios.” To that end, ADVA requested copies of all comparable patent license agreements, including all agreements of ADVA’s competitors and key customers in at least Germany, UK, and United States, if any. ADVA stated, “you may remove or blacken the licensee’s details for confidentiality purposes.” ADVA also agreed to “maintain every agreement or information proprietary and confidential, never to disclose it, and agree to protect it.”

87. ADVA, in further reconfirming its “objective here is to close a global (cross-) licensing agreement which gives both Huawei and ADVA peace of mind,” requested Huawei also: provide the royalty stack Huawei believes its offer suggests related to all OTN SEPs; confirm the proposed OTN and DC SEPs are complete and that for all patents the parties would agree on a covenant not to sue for all ADVA product lines; provide a list of SEPs not covered, if any, so ADVA can assess completeness; advise how Huawei intends to consider ADVA’s patents in a cross-license agreement; and provide Huawei sales data or estimates for comparable Huawei products so ADVA can value the cross-license. In a follow-up communication, ADVA confirmed

that, regardless of the missing information, it would still make a counteroffer at the next meeting based on the information in ADVA’s possession.

88. Huawei responded to these requests for clarification in an email to ADVA on March 29, 2023. While Huawei clarified certain points regarding the Licensed Standards and Licensed Products, Huawei refused to provide any comparable licenses or information from such licenses (even public information) to support its proposed royalty rates. Instead, for the first time, it confirmed “Huawei is the *licensee* for the comparable license [from the August 2, 2022 presentation] signed before,” not the licensor. Huawei did not make this clear to ADVA until months after Huawei’s opening offer and still provided no information regarding how such agreement, where Huawei was a licensee, was relevant and comparable in a manner that supported Huawei’s proposed rates. And Huawei confirmed its proposed royalty rates are “derived from comparable licenses Huawei signed before” as a *licensee*, in contrast to a “top-down” royalty stack methodology or any comparable agreement where Huawei is the licensor.

89. ADVA and Huawei met as scheduled on March 30, 2023. At this meeting, ADVA again “made it clear [it] is willing to take a license from Huawei at any terms that are in fact FRAND.”

90. As summarized in an April 7, 2023 email from ADVA to Huawei, during the meeting, Huawei again clarified that all cited royalty rates in the August 2, 2022 presentation (apart from the *Telcordia vs. Cisco* case) refer to license agreements which Huawei closed as licensee, and not as licensor. Huawei “took the position that these agreements – which strictly do not relate to the same OTN and DC areas and have likely been closed under different conditions and at different times – can be used as a basis for an OTN and DC FRAND license offer.” Huawei provided no analysis or rationale to support this position. ADVA responded that “it was critical

for ADVA to be given access to these agreements to assess their potential relevance or lack thereof as comparable licenses.” Huawei refused this request. ADVA further asked Huawei to “disclose actual copies of all comparable licenses relevant to the [SEPs] discussed here.” Huawei claimed that no such licenses exist. ADVA also requested that Huawei share any settlement agreement that came out of Huawei’s legal dispute with Verizon concerning Huawei’s OTN SEP patents. Huawei again refused but separately contended, again with no support whatsoever, that the agreement entered into with Verizon’s supplier would support a rate higher than the rate offered ADVA. ADVA responded by explaining that “FRAND principles oblige Huawei to disclose such agreements,” and confirmed that “[a]ny confidentiality concerns Huawei may have can be satisfied by appropriate confidentiality terms and ADVA has been transparent in agreeing to protect the confidentiality of these materials.”

91. ADVA provided a counteroffer to Huawei during the March 30, 2023 meeting. ADVA’s counteroffer followed a “top-down” methodology in which the rate is considered fair, reasonable, and non-discriminatory for all SEPs on OTN products. ADVA confirmed its proposed royalty rate is representative of the economic value of the SEPs and allows licensees (like ADVA) to continue their business operations or to enter and maintain a sustainable market position in the industry. In contrast, ADVA confirmed that a higher royalty rate, like the royalty rates proposed by Huawei, would prohibit companies from entering into or maintaining a sustainable market position and would “eliminate market competition.”

92. In an April 11, 2023 email response to ADVA, Huawei continued to advance its “take it or leave it” approach and refused to consider ADVA’s counteroffer or provide its own counteroffer. Huawei responded with a lengthy email communication on April 11, 2023, loaded with legal conclusions and complaints of delays and artificial counteroffers (none of which

accurately reflect the negotiations) and steadfastly refused to move off of its exorbitant discriminatory royalty rates. Huawei also maintained its refusal to provide any license agreements to ADVA for its consideration in the FRAND negotiations, claiming “strict confidentiality obligation” preventing the disclosure. Huawei acknowledged, however, that it could disclose these agreements with the “prior consent of the other contracting party,” but did not agree to seek that consent.

93. Huawei rejected ADVA’s NDA proposals and provided another edited version of the NDA in an email to ADVA on the same day, still refusing to include its Germany subsidiary as a party to the NDA, despite its employees being primarily involved in the negotiations. Once again, Huawei refused to sign an NDA under commonly accepted business terms and principles.

94. Huawei then sent a draft “Patent License Agreement” (“PLA”) to ADVA on April 17, 2023. Huawei once again refused to lower its proposed market dominating rates despite the meaningful information ADVA had provided warranting lower royalty rates.

95. ADVA responded by email to Huawei that same day to provide “an accurate assessment” of the negotiations to-date and to express its “wish to continue our productive and friendly discussion that we have had to date and not enter into protracted legal discussions when a solution appears very feasible.” ADVA reiterated that it is a willing licensee and welcomes the opportunity to take a license from Huawei on FRAND terms and conditions, but it does not believe that Huawei’s licensing offer to date is consistent with either the letter or spirit of FRAND. ADVA pointed out “as Huawei itself has expressly stated in the past, that any FRAND license here would need to recognize both parties’ business needs and particularly the unbalanced economic and market positions of the parties.” ADVA confirmed that “fairness and transparency guide our negotiations” and it is “evaluating what a FRAND offer from Huawei should look like in the

context of these negotiations.” But “all available evidence combined with Huawei’s refusal to engage in transparent negotiations creates concerns that the August 2, 2022 [offer] is non-FRAND, and this reality was reflected in ADVA’s FRAND counteroffer.” ADVA further confirmed that its “actions to date have not been to delay, as you state in your correspondence, but instead have been designed to gather appropriate and necessary information to assess whether Huawei’s offer is in fact FRAND.”

96. ADVA reiterated that for it “to fairly and transparently assess whether Huawei’s licensing proposal is or is not FRAND, ADVA should be entitled to obtain, without demands for excessive secrecy, details regarding the alleged basis and support for the patent holder’s SEP licensing demands.” ADVA further stated that it is “concerned that Huawei’s continued refusal to provide the requested material is an attempt to shield its current non-compliance with the obligation to license on FRAND terms” as “[s]ecrecy enables Huawei to extract supra-FRAND royalties, engage in discriminatory licensing, and to engage in unfair and imbalanced competition.”

97. ADVA, therefore, again requested to examine the “comparable” licenses that Huawei withheld in the negotiations. ADVA requested “[a]t a minimum, Huawei should produce the actual licenses described in the August 2, 2022 proposal as ‘comparable’” as “[t]here is no fair manner for ADVA to assess this information given the lack of transparency displayed by Huawei to date.” ADVA further challenged Huawei’s claims of confidentiality for these agreements as contrary to the required transparency and fairness in FRAND negotiations: “[i]t is an established principle of FRAND licensing respected by courts across the world that a licensee is entitled to make its own assessment of pre-existing agreements, instead of having to rely on the assessment of an undisclosed agreement by the licensor.” Furthermore, “[h]iding behind a purported ‘strict confidentiality regime’ casts significant doubt on Huawei’s statement and raises the specter of a

large SEP patent holder seeking supra-competitive rates while refusing to provide the very documents that it alleges support such rates.”

98. In addition, ADVA expressed concern that Huawei was now attempting “to inject different patents into the negotiations,” confirming “that Huawei has *not* fulfilled its notice obligation because ADVA is not currently aware of the specific patents that Huawei would like to discuss.” ADVA stated that “it cannot be fairly said that Huawei has provided an ‘explanation of infringement’ by ADVA without even properly identifying the patents to analyze, and ADVA has already provided non-infringement and invalidity positions for the 30 exemplary patents identified to date.” ADVA also expressed its concern that Huawei’s effort to introduce other patents into the discussion raises serious concerns that Huawei is responsible for any delays that have occurred in the discussions between the parties. ADVA requested that Huawei clarify, with complete transparency, all of Huawei’s patents and relevant standards that Huawei considers relevant to this FRAND negotiation. ADVA confirmed its intent to meet with Huawei on April 25, 2023.

99. To assist the parties in their next meeting, ADVA sent a detailed analysis of the draft PLA to Huawei in an email on April 20, 2023. ADVA noted the royalty rate combination in that PLA contained an aggregated royalty rate of 6.5%. ADVA also requested that Huawei provide the complete set of the 514 OTN and DC SEP claim charts it claimed to have prepared during the August 2, 2022 presentation, to assist ADVA in evaluating the context of Huawei’s FRAND offer. ADVA further confirmed that “it is willing to propose an improved counter-offer that reflects Huawei concerns or arguments expressed in [its] email of April 11, 2023,” even though “Huawei has not moved at all from its original offer since August 2, 2002 (which we believe is a failure on Huawei’s side to actually negotiate in good faith).”

100. Huawei responded to ADVA in an email on April 21, 2023, again failing to provide any information to justify its royalty rate offers. Huawei continued to hide behind confidentiality and claimed that it could not disclose any license agreement. Huawei also continued to point to royalty rates for “cellular products (e.g. handset devices)” for a “cross-check” of the offered royalty rates without any explanation how this is comparable to OTN and DC standards and products. Huawei again failed to provide any royalty rates for its licensing of its OTN or DC SEPs, or comparable SEPs.

101. Huawei also now claimed that it “has in total more than 1,824 patents and patent applications that may be of relevance to ADVA,” including “514 OTN and DC patents and patent applications.” Huawei attached “101 claim charts (not OTN and DC SEPs).” But Huawei failed to provide the complete set of 514 claim charts of the OTN and DC SEPs it claimed to have (and that the parties have been discussing) despite an express request from ADVA.

102. Huawei continued to claim that an NDA between ADVA and the Germany subsidiary was not necessary and now claimed that the German subsidiary is not the negotiating entity, despite employees of that subsidiary being heavily involved in the negotiations.

103. Huawei also rejected ADVA’s updated counteroffer and, yet again, refused to decrease its original offer. Huawei claimed that ADVA’s updated counteroffer is “not backed up by comparable license,” despite the fact that Huawei had refused to provide the details of what it claimed “comparable” licenses were. Huawei also failed to provide any explanation for why it had never reduced its proposed royalty rates over a period of many months of negotiations.

104. Huawei further responded to ADVA’s comments regarding the draft PLA in an email to ADVA on April 22, 2023. Despite representing during the initial meeting between the parties that it possessed claim charts for all its alleged 514 OTN and DC SEPs, Huawei ignored

ADVA's request for these charts and shifted direction once again, now claiming that "the normal technical discussions during patent license discussion would only refer to a set of sampled/exemplary claim charts, but not all claim charts of each and every patent in such patent portfolio." Huawei also rejected ADVA's increased counteroffer and yet again refused to move from its original non-FRAND offer, continuing the "take it or leave it" strategy that violate its obligations to negotiate in good faith.

105. The parties met again on April 25, 2023 and continued to exchange correspondence following the meeting. ADVA continued to express a willingness to obtain a FRAND license and Huawei continued its failure comply with its FRAND obligations.

#### **F. Huawei's Long-running Practices to Illegally Dominate the Market**

106. Huawei's failure to negotiate in good faith with ADVA for FRAND terms and conditions and to instead seek an exorbitant and unsupported FRAND rate is just one example of the attempts by Huawei and its affiliates and subsidiaries to manipulate global markets and/or to take credit for the innovations of others. Huawei has a long record of failing to play by the rules where intellectual property is concerned in the United States and throughout the world.

107. In 2019, the United States government through the Department of Justice indicted Huawei for violating several provisions of the U.S. Code. In the February 2020 third superseding indictment, the Department of Justice accused Huawei and its subsidiaries, including in the U.S., of decades-long efforts of devising schemes to operate and grow its business by misappropriating the intellectual property of several U.S. companies, beginning in or about 2000.<sup>1</sup>

108. The indictment alleges that by misappropriating the intellectual property of U.S. companies Huawei unfairly benefitted from the sale of products containing stolen intellectual

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<sup>1</sup> <https://www.justice.gov/opa/press-release/file/1248961/download>.

property, allowing Huawei to drastically cut its research and development costs and providing the company a significant unfair competitive advantage in the market.

109. The indictment alleges that the means and methods of improper misappropriation by Huawei included entering into confidentiality agreements with the owners of intellectual property and then violating the terms of the agreements by misappropriating the intellectual property for Huawei's own commercial use among other illicit means of unfairly competing.

110. The indictment further alleges that Huawei and its subsidiaries, including in the U.S., improperly arranged for shipments of Huawei goods and services to end users in sanctioned countries through local affiliates in the sanctioned countries.

111. To minimize its liability for the misappropriation of intellectual property, the indictment further alleges that Huawei engaged in a pattern of obstruction, including by providing false information to U.S. officials in the form of affidavits or reports of internal investigations in civil proceedings and by instructing employees to conceal information.

112. The U.S. government further alleges that Huawei, and its affiliates and subsidiaries, agreed to use the proceeds derived from the theft of intellectual property to establish and operate the business of Huawei in the United States and abroad. Huawei agreed to benefit from the cost savings generated from stealing intellectual property to eschew research and development and to wrongly use others' technology to also establish and operate Huawei's business in the United States.

113. The U.S. government further charged Huawei with racketeering, alleging that Huawei has for many years acted as an enterprise with its parents, global affiliates and subsidiaries, with the principal purpose to grow the global "Huawei" brand by entering, developing, and

dominating the markets for telecommunications and consumer electronics and services in countries including the United States.

114. The superseding indictment states, “HUAWEI and its parents, global affiliates and subsidiaries, including HUAWEI DEVICE, HUAWEI DEVICE USA, FUTUREWEI and SKYCOM, constituted an ‘enterprise,’ as defined in Title 18, United States Code, Section 1961(4), that is, a group of legal entities associated in fact (hereinafter, the ‘Huawei Enterprise’),” and explains, “[t]he Huawei Enterprise was engaged in, and its activities affected, interstate and foreign commerce.”

115. The Huawei Enterprise, as alleged, operates and has engaged in unlawful conspiracy activity in several Districts in the United States, including in the Eastern District of Texas.

116. Beyond the above anticompetitive and unfair acts, the indictment further charges Huawei and its U.S. affiliate with having launched, in 2013, a formal written policy describing a bonus program to encourage employees to steal confidential information from competitors.

117. According to a Department of Justice statement regarding the indictment, “Huawei’s efforts to steal trade secrets and other sophisticated US technology were successful,” and the company “obtained nonpublic intellectual property relating to internet router source code, cellular antenna technology and robotics” to gain an “unfair competitive advantage” over competitors.<sup>2</sup>

118. In a joint statement addressing the indictment, members of the Senate Intelligence Committee said, “Intellectual property theft, corporate sabotage, and market manipulation are part

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<sup>2</sup> <https://www.justice.gov/usao-edny/pr/chinese-telecommunications-conglomerate-huawei-and-subsidiaries-charged-racketeering>.

of Huawei’s core ethos and reflected in every aspect of how it conducts business. It uses these tactics indiscriminately against competitors and collaborators alike.”<sup>3</sup>

119. Two representatives of the Chinese government were later, in October of 2022, charged by the U.S. government with conducting foreign intelligence operations against the United States to interfere with the Huawei prosecution and investigation.<sup>4</sup> Specifically, the U.S. government alleges that two Chinese intelligence officers, operating on behalf of the Chinese government and for the benefit of Huawei, attempted to obstruct justice by bribing a U.S. law-enforcement official to obtain what they believed was inside information concerning witnesses, trial evidence and potential new charges in the U.S. government’s ongoing criminal case against Huawei. The Chinese intelligence officers allegedly communicated an understanding that confidential information concerning cooperating witnesses and trial evidence would be shared with Huawei for Huawei’s benefit. On information and belief, Huawei and the Chinese government operated in concert in an effort to wrongly obtain information concerning the U.S. government’s investigation of Huawei’s unfair competition and purportedly criminal acts with regard to an effort to dominate the worldwide market through the misuse of intellectual property.

120. This is not Huawei’s only charge of theft of intellectual property in the United States attempting to dominate the market. Huawei was embroiled in civil and criminal actions related to Huawei’s multi-year efforts to steal trade secrets of T-Mobile’s “Tappy” robot and recreate Tappy because of the market advantage it was giving T-Mobile at the time. In 2017, a jury awarded T-Mobile \$4.8 million in damages, and the parties ultimately settled T-Mobile’s civil

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<sup>3</sup> <https://www.warner.senate.gov/public/index.cfm/2020/2/statement-of-sens-warner-and-burr-on-eastern>.

<sup>4</sup> <https://www.reuters.com/legal/us-charges-two-chinese-defendants-with-trying-obstruct-telecom-prosecution-2022-10-24/>; <https://www.justice.gov/opa/press-release/file/1546421/download>.

claims. In 2019, a grand jury in the Western District of Washington indicted Huawei for conspiring to steal T-Mobile’s trade secrets based on the same operative facts that gave rise to the “Tappy” civil suit.<sup>5</sup>

121. In 2020, another individual admitted to helping steal technology from a United States company for Huawei.<sup>6</sup> In that case, prosecutors alleged that a visiting professor at the University of Texas at Arlington agreed with a California technology company to obtain its circuit board, purportedly for academic research, but then shared proprietary information with Huawei.

122. Indeed, the U.S. government’s concerns with Huawei’s anti-competitive behavior and threats to both national security and the economy go back more than a decade. In a 2010 bipartisan letter to the Chairman of the Federal Communications Commission, lawmakers identified that Huawei was “financed by the Chinese government,” “receiv[ing] tens of billions of dollars in export financing and ‘low- to no-interest loans that needn’t be repaid’ from the Chinese government.”<sup>7</sup> The loans were paired with Huawei taking “aggressive steps to increase penetration in the U.S. telecommunication market.” Thus, while Huawei is a privately owned company based on its registrations, in 2011, the U.S.-China Economic and Security Review Commission identified Huawei as being subject to Chinese influence based on favorable government policies, which aim is to support Huawei’s development and pose obstacles to foreign competition.

123. The U.S. government has initiated legal efforts to limit Huawei’s access to telecommunications system and markets.<sup>8</sup> For example, in 2017, the U.S. government prohibited

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<sup>5</sup> <https://www.wawd.uscourts.gov/sites/wawd/files/HUAWEI%20INDICTMENT.pdf>.

<sup>6</sup> <https://www.reuters.com/article/us-huawei-tech-usa/chinese-professor-despite-no-remorse-to-return-home-after-guilty-plea-in-huawei-theft-case-idUSKBN28O2JQ>.

<sup>7</sup> *Huawei Techs. USA, Inc. v. United States*, 440 F. Supp. 3d 607 (E.D. Tex. 2020).

<sup>8</sup> See <https://crsreports.congress.gov/product/pdf/R/R46693>.

the Department of Defense from procuring certain telecommunications equipment from Huawei. Congress later extended this ban to all executive branch agencies. The U.S. government has also instituted legal actions to ban Huawei from telecommunications networks in the United States.

124. In March 2019, Huawei filed suit in the Eastern District of Texas, the location of Huawei USA's headquarters, arguing that part of the National Defense Authorization Act (NDAA) and related regulatory actions taken by the U.S. government infringed on the company's constitutional rights and harmed its existing and future business. The Court dismissed the complaint, ruling that Huawei's arguments were "unpersuasive."<sup>9</sup>

#### **COUNT I: BREACH OF CONTRACT BASED ON ITU-T FRAND OBLIGATIONS**

125. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

126. Huawei entered into express or implied contractual commitments with ITU-T and its members, affiliates and adopters relating to the OTN and DC standards.

127. Each third party that would potentially implement the OTN or DC standards technology was an intended beneficiary of these contracts. Huawei was contractually obligated, among other things, to identify and to offer a license to its essential patents consistent with the applicable IPR Policy of the ITU-T.

128. Huawei is contractually obligated to offer a license to its essential patents to ADVA consistent with the ITU-T's IPR Policy, including that such a license be on FRAND terms and conditions.

129. ADVA was entitled to rely on Huawei's FRAND contractual obligations, both as an ITU-T member and as a third-party beneficiary.

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<sup>9</sup> *Huawei Techs. USA, Inc. v. United States*, 440 F. Supp. 3d 607 (E.D. Tex. 2020).

130. Huawei breached its contractual obligations by, among other things, (i) failing and refusing to license its OTN and DC SEPs on FRAND terms and conditions, (ii) seeking excessive royalty rates, (iii) refusing to negotiate from its opening royalty offer and engaging in hold-out, (iv) demanding exorbitant royalties relative to the contribution of any purported “essential” technology and patents, (v) engaging in a lack of transparency and fairness in negotiation by, for example, refusing to provide sufficient details regarding comparable licenses, hiding behind dubious confidentiality concerns regarding such licenses, failing to identify the licensor/licensee in the comparable licenses, providing only generic information regarding the licensed technology in the comparable licenses, and refusing to provide the comparable licenses, (vi) delaying signing of a NDA to expressly include one of the Huawei companies involved in the negotiations and unnecessarily drawing out the NDA process such that Huawei could avoid disclosing confidential information to ADVA as part of the negotiations, (vii) identifying numerous other communication standards for which Huawei is not offering a license in an attempt to secure a license with grossly excessive or, alternatively, supra-competitive royalties, (viii) discriminatorily mixing non-essential patents with FRAND-encumbered OTN and DC SEPs in an effort to force ADVA to pay exorbitant, non-FRAND royalties, and (ix) offering licenses to Huawei’s OTN and DC patent portfolios but declining to include in those portfolios all of Huawei’s OTN and DC patents that Huawei contends are essential to the ITU-T’s OTN and DC standards.

131. Huawei has refused to engage in good-faith negotiations, opting instead for a “take it or leave it” hold-up approach.

132. Huawei’s actions threaten to prevent ADVA’s implementation of the technology of the allegedly “essential” patents should ADVA refuse to pay Huawei grossly excessive royalties,

that would prevent ADVA from making, using, selling, and importing products that incorporate such technology.

133. As a direct and necessary result of Huawei's contractual breaches, ADVA has been injured in its business or property, has been forced to expend substantial resources negotiating with Huawei, and is threatened by an imminent loss of profits, loss of customers and potential customers, and loss of goodwill and product image in a manner that was actually foreseen, or was reasonably foreseeable, by Huawei at the time Huawei's contractual commitments with the OTN and DC standards were formed.

134. Huawei's refusal to offer a license to ADVA on FRAND terms and conditions has deprived ADVA of its right to obtain a license to Huawei's OTN and DC SEPs and exposed ADVA to the risk of future patent infringement claims by Huawei.

135. Huawei's licensing offers to ADVA violated its commitments to the ITU-T and are entirely inconsistent with FRAND principles. Huawei has negotiated in bad faith in an unfair manner and has attempted to maximize the hold-up value it can extract from ADVA.

136. On information and belief, Huawei is attempting to exploit the power it gained through its involvement with working groups and the standardization of its patents to demand grossly excessive royalty rates that are wholly disproportionate with the value of any technical contribution of its alleged SEPs.

137. ADVA has suffered and will suffer injury in fact by reason of Huawei's unlawful, unfair and fraudulent acts and has lost, and continues to lose, money or property.

**COUNT II: DECLARATORY JUDGMENT OF OBLIGATION OF HUAWEI TO  
LICENSE STANDARD ESSENTIAL PATENTS ON FRAND TERMS AND  
CONDITIONS AND DECLARATION OF FRAND TERMS AND CONDITIONS**

138. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

139. Huawei, including its related entities, affiliates, and successors- and predecessors-in-interest, have participated in the development and implementation of industry standards through its membership and participation in SSOs, including ITU-T. Huawei submitted licensing declarations committing to license its intellectual property on FRAND terms and conditions. Accordingly, Huawei, including its related entities, affiliates, and successors- and predecessors-in-interest, is contractually obligated by FRAND commitments of the ITU-T and its members, including ADVA.

140. As members of the public that would potentially implement the standards set forth by the ITU-T, ADVA and its customers are intended third-party beneficiaries of Huawei's contractual commitments and obligations to the ITU-T, including Huawei's general and specific licensing declarations identified herein. Every party producing products that implement ITU-T recommendations, including ADVA, is an intended third-party beneficiary of Huawei's voluntary contractual obligations to the ITU-T.

141. As set forth above, Huawei has not engaged in good faith negotiations to reach an agreement on FRAND terms and conditions for ADVA to license Huawei's OTN and DC SEPs.

142. Huawei's has thus failed to provide ADVA with FRAND terms and conditions to its OTN and DC SEPs.

143. On information and belief, to the extent that any of the U.S. patents identified in Counts V-IX, or any of Huawei's OTN or DC SEPs, are infringed by ADVA that is the result of implementing one or more standards promulgated by the ITU-T to which Huawei has contractual commitments to offer and provide FRAND licenses.

144. As a result of the acts detailed herein a substantial continuing and justiciable controversy of sufficient immediacy exists between Huawei and ADVA as to the FRAND terms

and conditions for the patents identified in Counts V-IX and/or for a global license to Huawei's OTN and DC SEPs.

145. Absent a declaration of ADVA's rights to a license and the FRAND terms and conditions for such a license, Huawei will continue to cause ADVA injury and damage.

146. Under the Federal Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA requests a judicial determination and declaration that (1) Huawei has not offered ADVA a license to its OTN and DC SEPs on FRAND terms and conditions, (2) ADVA is entitled to a license on FRAND terms and conditions to any one or more of Huawei's patents identified in Counts V-IX deemed essential to an implementation of any standard, recommendation or specification set forth by the ITU-T (3) ADVA is entitled to a license on FRAND terms and conditions to Huawei's OTN and DC SEPs, and (4) a determination of the FRAND terms and conditions for U.S. and/or global license to Huawei's OTN and DC SEPs with those conditions being imposed on the parties.

### **COUNT III: FRAUD (TEXAS)**

147. ADVA realleges and incorporates by reference the allegations set forth in the foregoing paragraphs.

148. In light of the importance of standardization to the increasingly technology-driven global economy, and the need to make such technologies widely available, SSOs require that members make promises and enter into agreements that they will license their technology to be included in a standard on FRAND terms and conditions.

149. SSOs reasonably rely upon such promises to ensure that members like Huawei that have their technologies included in the standards—to the exclusion of alternatives—do not later abuse their market position to exclude rivals and other implementers from product markets.

150. Huawei knowingly, or recklessly and without regard to its truth, made a false promise to the ITU-T that it would license its technology on FRAND terms and conditions so as to induce those SSOs to adopt its technology. Huawei affirmatively misrepresented its intent to license its technologies on FRAND terms and conditions to the ITU-T. Huawei, as part of its efforts to have its patents declared essential, falsely committed to offer licenses on FRAND terms and conditions to the essential patents.

151. Huawei knew that absent such a promise, the ITU-T would not have adopted its technology and would have searched for alternatives, revised or even abandoned the standard altogether if a viable alternative could not be found that avoided Huawei's technology.

152. Huawei thus intended to induce, and did induce, the ITU-T to rely on Huawei's false promise and allegedly adopt Huawei's technology into the OTN and DC standards.

153. In light of the ITU-T's patent policies, which were published to the public and to the industry, entities like ADVA that invest in and use equipment using standards continued to invest in that equipment, as opposed to pursuing viable alternative technologies that were available. ADVA reasonably relied upon Huawei's commitments to the ITU-T that Huawei would license its SEPs at FRAND rates.

154. In reliance upon Huawei's promise to offer FRAND licenses, ADVA expended substantial resources in research and development, manufacturing and marketing of products that comply with the OTN and DC standards, which allegedly incorporate Huawei's patents.

155. For example, ADVA's research and development team based in Richardson, Texas, relies on commitments to standard-setting bodies when analyzing and determining whether to invest in developing equipment containing certain technology. If ADVA's team in Richardson, Texas had known that Huawei would not live up to its FRAND commitments, ADVA's team

would have made different decisions regarding its development efforts, and/or would have joined others in advocating to standardize an alternative technology to perform the relevant functions, or to leave the relevant functions out of the standard.

156. Once the technologies were widely adopted, and the industry became locked into the standards that allegedly incorporate Huawei's patents, Huawei reneged on its promise by exploiting its new-found market power to demand unreasonable and excessive royalties and terms, far in excess of the patents' own value in an effort to dominate the telecommunications markets in Texas, the United States, and globally.

157. To date, Huawei has failed to offer ADVA a license on FRAND terms and conditions for any of the patents it claims to be essential to the OTN and DC standards and that it committed to license on FRAND terms and conditions.

158. Since the commencement of licensing negotiations between ADVA and Huawei, ADVA has repeatedly asked for Huawei to provide basic information necessary for ADVA to determine whether the rate that Huawei demands is in fact, fair, reasonable, and non-discriminatory, including any indication that other companies are also paying the royalty rates that Huawei seeks from ADVA, and copies or summaries of comparable license agreements.

159. The only offer that Huawei made failed to comply with its FRAND obligations. The piecemeal details of agreements that Huawei made available are not "comparable," and Huawei has repeatedly refused to provide any information about any license agreements covering the SEP patents with other companies. On information and belief, Huawei has entered into license or settlement agreements with other companies that implement the relevant standards, but Huawei has refused to identify the terms and conditions of those licenses. Huawei has also repeatedly

refused to provide copies of any license agreement it contends is “comparable,” or any details regarding any license agreements for which it is the licensor for the SEPs or comparable SEPs.

160. Huawei failed to comply with its FRAND promises and obligations by attempting to extort exorbitant non-FRAND royalty rates from ADVA and knowingly and intentionally failing to provide the relevant information and transparency in the negotiations that FRAND requires. Huawei began its negotiations by demanding an exorbitant royalty rate and never decreased its rate in more than eight months of negotiations, thus violating its duty to negotiate in good faith.

161. Huawei’s commitments to the ITU-T were misrepresentations that Huawei knew were false at the time they were made. Huawei has refused to license its declared essential patents on FRAND terms and conditions, including by offering non-FRAND terms and conditions and refusing to negotiate in good faith. Each of the above commitments and misrepresentations by Huawei and its representatives to the ITU-T were material and false, Huawei knew these commitments and representations were intended to induce implementers and users of the relevant standards, such as ADVA, to continue to implement and use the relevant standard, and ADVA actually and justifiably relied on these commitments and misrepresentations, to its detriment and injury.

162. As a result of Huawei’s false promises and fraudulent conduct, and ADVA’s reasonable reliance on these promises, ADVA has been injured in its business or property, and is threatened by imminent loss of profits, and loss of customers and potential customers and its business in Texas, in the United States, and globally.

**COUNT IV: UNFAIR COMPETITION (TEXAS)**

163. ADVA realleges and incorporates by reference the allegations set forth in the foregoing paragraphs.

164. Huawei's unlawful, discriminatory, and unfair conduct constitutes unfair competition under Texas law and Huawei has interfered or threatens to interfere with competition and ADVA's ability to conduct its business.

165. As discussed above, Huawei has committed unlawful and unfair acts that violate its FRAND obligations. Huawei fraudulently misrepresented its commitment to abide by FRAND to induce the adoption of its alleged SEPs into the standards. Huawei has failed to abide by its FRAND commitments, including by offering non-FRAND royalty rates and refusing to negotiate and license its SEPs to ADVA on FRAND terms and conditions. This wrongful conduct has interfered, and threatens to interfere, with ADVA's ability to conduct its business in and from this District, in the United States, and globally.

166. As a result of the standardization, Huawei gained significant increased market power that it would not have had absent the inclusion of its patents into the standards. When the standards became widely adopted, and thus ADVA and others became locked-in, Huawei then proceeded to exploit that market power by demanding unreasonable license terms, including excessive and extortionist royalties, in violation of its agreements with the ITU-T. Huawei's non-FRAND royalty demands have interfered or threatened to interfere with competition and ADVA's ability to conduct its business in and from this District, in the United States, and globally.

167. Notably, Huawei is among hundreds of companies with purported essential patents relevant to these technologies. If each such company with a FRAND commitment was permitted to charge such excessive royalties as Huawei is demanding, the royalty burden on the products would leave little to no room for profitability and further investment in innovation. Not only would

companies like ADVA be harmed in its business, but so too would consumers, who ultimately would suffer either in terms of higher prices or less innovation.

168. If ADVA agreed with what Huawei has proposed as FRAND rates, ADVA would be required to pay royalty rates well in excess of its profits, thereby destroying the competitiveness of ADVA products in the marketplace and interfering with its business and competition in Texas, in the United States and globally. Huawei is further attempting to leverage its market power in its asserted essential patents to gain leverage in separate markets for patents related to other technology or standards where it does not otherwise possess market power to separately force ADVA to take a non-FRAND license and further interfere with its business and competition in Texas, in the United States and globally.

169. Moreover, Huawei has committed unlawful and unfair acts that violate 15 U.S.C. § 45 (“The FTC Act”) by making a misrepresentation concerning its contractual obligations to the ITU-T. By failing to honor an encumbrance on its patents by misrepresenting a willingness to license on FRAND terms, Huawei has violated the FTC Act through a discriminatory licensing practice recognized as illegal by the FTC. As members of the Senate Intelligence Committee stated in a joint statement about the U.S. Government’s indictment against Huawei: “Intellectual property theft, corporate sabotage, and market manipulation are part of Huawei’s core ethos and reflected in every aspect of how it conducts business. It uses these tactics indiscriminately against competitors and collaborators alike.”<sup>10</sup> Huawei’s renegeing on FRAND commitments has caused harm to ADVA, competition and consumers alike.

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<sup>10</sup> <https://www.warner.senate.gov/public/index.cfm/2020/2/statement-of-sens-warner-and-burr-on-eastern>.

170. This unfair business activity permeates every aspect of Huawei’s business. Here, as part of its continued wrongful efforts to manipulate the telecommunications market, Huawei has not engaged in good faith negotiations and has dogmatically demanded exorbitant non-FRAND rates from ADVA.

171. Huawei has refused from the beginning of its so-called FRAND negotiations with ADVA to be transparent with regard to the disclosure of comparable agreements and other necessary relevant information so that the parties could engage in a back-and-forth fair negotiation that results in a fair, reasonable and non-discriminatory rate. By targeting a smaller implementer like ADVA and imposing a strict “take it or leave it” offer that finds no basis in fact or in the information provided to ADVA to date, Huawei is wrongly attempting to interfere with ADVA’s ability to do business in this District and the United States. Huawei’s demanded excessive and one-sided royalty rates would effectively put ADVA out of business, in furtherance of the Huawei’s goal of dominating the market for telecommunications in Texas, the United States, and globally.

172. Moreover, the Huawei Enterprise’s ongoing conspiracy wrongfully attempts to apply further royalty stacking to ADVA through the disclosure of more than 1,000 additional non-OTN/DC SEPs that Huawei contends should be separately discussed and licensed outside of this FRAND-discussion context. Notwithstanding this voluminous disclosure, Huawei has provided no claim charts, no information regarding how the Huawei patents could be relevant to ADVA. This unsupported threat of additional patents rings of a classic hold-up effort and directly interference with ADVA’s ability to conduct business in the Eastern District of Texas and throughout the world.

173. Huawei made other fraudulent misrepresentations concerning essentiality to deceive the ITU-T during the standard-setting process. As part of ITU-T's Study Group 15, which included various entities collaborating on development of a standard, Huawei submitted a technical contribution (a document known as Contribution 458 or "C-458," dated May 2007) that purported to introduce Huawei's own technical innovations. However, in reality, in that document Huawei misappropriated the technology of others and falsely portrayed such misappropriated technology as its own. In C-458, Huawei stated that "[i]n present G.709, a Tributary Slot conception is used to multiplex ODUj to ODUk" and "[w]e combine this method with bit rate agnostic CBR mapping together to create a new multiplexing scheme." In the optical transport network defined by the ITU-T G.709 standard, ODUj and ODUk refer to optical channel data units (ODU) having capacities specified by the indices j and k. The improvement to the known ODU multiplexing technique was not a Huawei innovation, contrary to Huawei's representation. The bit rate agnostic CBR mapping described by Huawei in C-458 was previously proposed by another standard-setting participant, Siemens, at least as early as 2000, and that would have been known to Huawei because Huawei was involved in G.709 standard setting. Thus, Huawei did not create or contribute a new multiplexing scheme at all, contrary to its statements in C-458.

174. Huawei further stated in C-458 regarding its contribution that "[t]he OPUk payload would be divided into n slots, where n is a signal-specific parameter that would depend on the client signals mapped into this OPUkATS" and "[i]f  $3808/n$  is not an integer, the remainder columns are stuffed." But that payload-division approach was previously presented by another ITU-T standard-setting participant at a prior meeting of Study Group 15, in a document labeled WD17 and titled "Proposed extension of G.709 to higher bit rates" at a meeting February 27-March 2, 2007.

175. These misrepresentations to ITU-T in the context of the ITU-T standard-setting process constitute examples of Huawei's knowing misrepresentations to ITU-T and its members, including ADVA. Huawei knew its contribution to G.709 was actually the innovation of other entities, because Huawei was an active participant in the ITU-T standard-setting process and knew the other participants and their contributions and discussions at working group meetings. At minimum, Huawei's statements in C-458 about its purported contributions were made recklessly and without regard to their truth.

176. Huawei also falsely misrepresented to the ITU-T that it held patents and/or pending patent applications essential to G.709, in its patent statement and licensing declaration to the ITU-T. On information and belief, Huawei knew, or had reckless disregard for the truth, that the technologies disclosed in such patents were actually misappropriated from others.

177. Huawei made similar false representations regarding other ITU-T standards. For example, in its patent statement and licensing declaration to the ITU-T, Huawei falsely misrepresented that it held patents and/or pending patent applications essential to G.Sup70, whereas it knew, or had reckless disregard for the truth, that it had actually misappropriated the subject technologies from others.

178. Thus, Huawei fraudulently misused the ITU-T's standardization process to cause misappropriated technologies, not actually those of Huawei, to be included in ITU-T standards that the industry then implemented. Because of Huawei's misconduct in the standard setting process, Huawei improperly gained undeserved leverage regarding standard essential patents and amplified its hold-up capabilities that Huawei is now employing against ADVA. Huawei currently demands exorbitant royalties for patents that Huawei asserts are essential to standards, but which in reality are misappropriated from others. Huawei intended to induce, and did induce, the ITU-T

to rely on Huawei's false misrepresentations and adopt Huawei's technology into standards, including G.709 and G.Sup70. Additionally, to the extent Huawei contends ADVA's products or processes include features of standard(s), Huawei intended to induce, and did induce, third party beneficiaries such as ADVA to implement such misappropriated technology, which became part of the ITU-T standards, into the products of the third party beneficiaries.

179. Huawei has provided claim charts to ADVA that map claims of Huawei's U.S. Patent Nos. 9,225,462 and 11,233,571 to the G.709 and G.Sup 70 standards, respectively and represented to ADVA that ADVA needs a patent license due to ADVA's implementation of the standards in its products. On information and belief, Huawei also falsely misrepresented to the ITU-T that it held patents essential to other ITU-T standards and induced reliance by the ITU-T and third party beneficiaries on such false representations.

180. In reliance upon the outcome of the ITU-T standardization process that Huawei abused to obtain improper holdup power, ADVA expended substantial resources in research and development, manufacturing and marketing of products that comply with the OTN and DC standards, which allegedly incorporate Huawei's patents. Additionally, ADVA's research and development team based in Richardson, Texas relies on the technologies present in the standards, in some instances technologies resulting from Huawei's standard-setting misconduct, when analyzing and determining whether to invest in developing equipment containing certain technology.

181. As a result of Huawei's fraudulent misrepresentations to the ITU-T regarding its technical contributions and SEPs, ADVA has been injured and is threatened by imminent loss of profits, and loss of customers and potential customers and its business in Texas, in the United States, and globally.

182. As a direct, proximate, and foreseeable result of Huawei's unfair and wrongful conduct, as alleged above, Huawei has interfered with ADVA's ability to do business in Texas and elsewhere by, among other things: (a) causing ADVA to face a threat of loss of profits and loss of customers and potential customers; and (b) being forced to expend money and other resources defending against Huawei's unlawful actions notwithstanding that Huawei has committed to license the SEPs on FRAND terms and conditions.

**COUNT V: DECLARATORY JUDGMENT OF NON-INFRINGEMENT OF U.S.  
PATENT NO. 9,225,462**

183. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

184. Huawei purports to be the owner of U.S. Patent No. 9,225,462 ("the '462 patent"). The '462 patent is titled "Method, apparatus and system for transmitting and receiving client signals" and issued on December 29, 2015 with Huawei Technologies Co., Ltd. listed as the assignee on the face of the patent. A copy of the '462 patent is attached as Exhibit 1.

185. Huawei declared the '462 patent essential to the ITU-T standards, including at least ITU-T Recommendation G.709/Y.1331 (02/2022).

186. Huawei, during negotiations, alleged that ADVA infringed and required a license to the '462 patent. Huawei identified this patent and its patent family as representative of ADVA's alleged infringement by virtue of practicing the ITU-T standards. Huawei provided a claim chart in support of its allegations mapping at least one claim of the '462 patent to the ITU-T standard (G.709/Y.1331 (02/2022)).

187. Representative claim 5 of the '462 patent recites the following:

[5pre]	5. An apparatus comprising a transmitter configured to couple to a receiver and to transmit client signals to the receiver, wherein the transmitter is configured to:
[5a]	map a client signal to a low-order Optical Channel Data Unit (ODU) via a Generic Framing Procedure (GFP) scheme, wherein the low-order ODU is sized to M equal sized timeslots of a high-order Optical Channel Payload Unit-k (OPUk), wherein the high-order OPUk is divided into N equal sized timeslots, wherein M is any one of a number group from 1 to N; wherein if k=2, then N=8, if k=3, then N=32, and if k=4, then N=80;
[5b]	map the low-order ODU with the client signal to M equal sized timeslots of the high-order OPUk via a Generic Mapping Procedure (GMP) scheme;
[5c]	form an Optical Channel Transport Unit (OTU) with the high-order OPUk and overheads; and
[5d]	transmit the OTU.

188. The '462 patent is not essential to the identified or any other ITU-T standards, and no claim of the '462 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by ADVA or the purchasers of ADVA's products through the manufacture, use, importation, sale, and/or offer for sale of ADVA's products, at least because, by way of non-limiting example, ADVA's products and processes and the identified standard(s) do not satisfy at least the following claim limitation(s): [5a], [5b], [5c], [5d].

189. There is thus a dispute between ADVA and Huawei concerning whether the '462 patent is actually essential to the ITU-T standards and whether certain of ADVA's products

infringe one or more claims of the '462 patent. A definite, concrete, real, substantial, and justiciable controversy exists between ADVA and Huawei regarding non-essentiality and non-infringement of the '462 patent with respect to Huawei's licensing demand. The controversy is of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

190. Under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA seeks a declaratory judgment that the '462 patent is not essential to the ITU-T standards and ADVA's products do not infringe and have not infringed any claim of the '462 patent.

**COUNT VI: DECLARATORY JUDGMENT OF NON-ESSENTIALITY AND NON-INFRINGEMENT OF U.S. PATENT NO. 11,233,571**

191. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

192. Huawei purports to be the owner of U.S. Patent No. 11,233,571 ("the '571 patent"). The '571 patent is titled "Method for processing low-rate service data in optical transport network, apparatus, and system" and issued on January 25, 2022 with Huawei Technologies Co., Ltd. listed as the assignee on the face of the patent. A copy of the '571 patent is attached as Exhibit 2.

193. Huawei declared the '571 patent essential to the ITU-T standards, including at least ITU-T Recommendation G.Sup 70 (08/20).

194. Huawei, during negotiations, alleged that ADVA infringed and required a license to the '571 patent. Huawei identified this patent and its patent family as representative of ADVA's alleged infringement by virtue of practicing the ITU-T standards. Huawei provided a claim chart in support of its allegations mapping at least one claim to the ITU-T standard (G.Sup 70 (08/20)).

195. Representative claim 1 of the '571 patent recites the following:

[1pre]	1. A method for processing service data in an optical transport network (OTN), wherein the method comprises:
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[1a]	mapping low-rate service data into a first data frame, wherein the first data frame comprises an overhead area and a payload area, wherein the payload area carries the low-rate service data, wherein the overhead area carries information for management and maintenance of the low-rate service data, wherein a rate of the payload area is greater than or equal to a rate of the low-rate service data, and wherein the rate of the low-rate service data is less than 1 gigabit per second (Gbps);
[1b]	mapping the first data frame into one or more micro slots in a second data frame, wherein a rate of each micro slot in the one or more micro slots is less than or equal to 100 megabits per second (Mbps);
[1c]	mapping the second data frame into an optical transport unit (OTU) frame; and
[1d]	sending the OTU frame.

196. The '571 patent is not essential to the identified or any other ITU-T standards, and no claim of the '571 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by ADVA or the purchasers of ADVA's products through the manufacture, use, importation, sale, and/or offer for sale of ADVA's products, at least because, by way of non-limiting example, ADVA's products and processes and the identified standard(s) do not satisfy the following claim limitation(s): [1b], [1c], [1d].

197. There is thus a dispute between ADVA and Huawei concerning whether the '571 patent is actually essential to the ITU-T standards and whether certain of ADVA's products infringe one or more claims of the '571 patent. A definite, concrete, real, substantial, and justiciable controversy exists between ADVA and Huawei regarding the non-essentiality and non-infringement of the '571 patent with respect to Huawei's licensing demand. The controversy is of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

198. Under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA seeks a declaratory judgment that the '571 patent is not essential to the ITU-T standards, and that ADVA's products do not infringe and have not infringed any claim of the '571 patent.

**COUNT VII: DECLARATORY JUDGMENT OF NON-INFRINGEMENT OF U.S.  
PATENT NO. 9,564,973**

199. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

200. Huawei purports to be the owner of U.S. Patent No. 9,564,973 ("the '973 patent"). The '973 patent is titled "Method and apparatus for transmitting and receiving interface signals of distributed base station" and issued on February 7, 2017 with Huawei Technologies Co., Ltd. listed as the assignee on the face of the patent. A copy of the '973 patent is attached as Exhibit 3.

201. Huawei declared the '973 patent essential to the ITU-T standards, including at least ITU-T Recommendations G.709/Y.1331 (02/2022) and G.Sup 56.

202. Huawei, during negotiations, alleged that ADVA infringed and required a license to the '571 patent. Huawei identified this patent and its patent family as representative of ADVA's alleged infringement by virtue of practicing the ITU-T standards. Huawei provided a claim chart in support of its allegations mapping at least one claim to the ITU-T standards (G.709/Y.1331 (02/2022) and G.Sup 56).

203. Representative claim 1 of the '973 patent recites the following:

[1pre]	1. A method for transmitting an interface signal through an optical transport network, comprising:
[1a]	mapping a plurality of Common Public Radio Interface (CPRI) signals of a distributed base station into an optical data unit k (ODUk) payload area of an optical transport unit k (OTUk) signal, wherein the k represents a transmission capacity of the OTUk signal,

	wherein the ODUk payload area is part of an ODUk, and wherein the ODUk is mapped into the OTUk;
[1b]	performing electro-optic conversion on the OTUk signal to generate an optical signal; and
[1c]	sending the optical signal.

204. The '973 patent is not essential to the identified or any other ITU-T standards, and no claim of the '973 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by ADVA or the purchasers of ADVA's products through the manufacture, use, importation, sale, and/or offer for sale of ADVA's products, at least because, by way of non-limiting example, ADVA's products and processes and the identified standard(s) do not satisfy the following claim limitation(s): [1a], [1b], [1c].

205. There is thus a dispute between ADVA and Huawei concerning whether the '973 patent is actually essential to the ITU-T standards and whether certain of ADVA's products infringe one or more claims of the '973 patent. A definite, concrete, real, substantial, and justiciable controversy exists between ADVA and Huawei regarding the non-essentiality and non-infringement of the '973 patent with respect to Huawei's licensing demand. The controversy is of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

206. Under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA seeks a declaratory judgment that the '973 patent is not essential to the ITU-T standards, and that ADVA's products do not infringe and have not infringed any claim of the '973 patent.

**COUNT VIII: DECLARATORY JUDGMENT OF NON-INFRINGEMENT OF U.S.  
PATENT NO. 10,164,728**

207. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

208. Huawei purports to be the owner of U.S. Patent No. 10,164,728 (“the ’728 patent”). The ’728 patent is titled “Method and apparatus for generic mapping procedure GMP and method and apparatus for generic mapping procedure GMP demapping” and issued on December 25, 2018 with Huawei Technologies Co., Ltd. listed as the assignee on the face of the patent. A copy of the ’728 patent is attached as Exhibit 4.

209. Huawei declared the ’728 patent essential to the ITU-T standards, including at least ITU-T Recommendation G.7044/Y.1347 (2011/10).

210. Huawei, during negotiations, alleged that ADVA infringed and required a license to the ’728 patent. Huawei identified this patent and its patent family as representative of ADVA’s alleged infringement by virtue of ADVA’s products practicing the ITU-T standards. Huawei provided a claim chart in support of its allegations mapping at least one claim to the ITU-T standard (G.7044/Y.1347 (2011/10)).

211. Representative claim 1 of the ’728 patent recites the following:

[1pre]	1. A method for generic mapping procedure (GMP) mapping customer service data in an optical transport network (OTN), the method comprising:
[1a]	carrying, in an optical channel payload unit (OPU) overhead (OH) of a first higher order (HO) OPU multiframe, a change indication of a number of time slots (TS) occupied by an ODUflex in a second HO OPU multiframe subsequent in time to the first HO OPU multiframe;
[1b]	adjusting, in accordance with the change indication, the number of TSs of the second HO OPU multiframe that need to be occupied by the ODUflex to a value different than the quantity of TSs of the first HO OPU multiframe occupied by the ODUflex;

[1c]	performing, GMP mapping on the ODUflex, in order to map the ODUflex into the adjusted quantity of one or more TSs of the second HO OPU multiframe; and
[1d]	transmitting the ODUflex, wherein the ODUflex carries customer service data.

212. The '728 patent is not essential to the identified or any other ITU-T standards, and no claim of the '728 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by ADVA or the purchasers of ADVA's products through the manufacture, use, importation, sale, and/or offer for sale of ADVA's products, at least because, by way of non-limiting example, ADVA's products and processes and the identified standard(s) do not satisfy at least the following claim limitation(s): [1a], [1b], [1c].

213. There is thus a dispute between ADVA and Huawei concerning whether the '728 patent is actually essential to the ITU-T standards and whether certain of ADVA's products infringe one or more claims of the '728 patent. A definite, concrete, real, substantial, and justiciable controversy exists between ADVA and Huawei regarding the non-essentiality and non-infringement of the '728 patent with respect to Huawei's licensing demand. The controversy is of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

214. Under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA seeks a declaratory judgment that the '728 patent is not essential to the ITU-T standards, and that ADVA's products do not infringe and have not infringed any claim of the '728 patent.

#### **COUNT IX: DECLARATORY JUDGMENT OF NON-INFRINGEMENT OF U.S. PATENT NO. 9,528,907**

215. ADVA realleges and incorporates by reference each of the foregoing paragraphs.

216. Huawei purports to be the owner of U.S. Patent No. 9,528,907 ("the '907 patent").

The '907 patent is titled "Method and device for detecting symmetry of optical fiber" and issued

on December 27, 2016 with Huawei Technologies Co., Ltd. listed as the assignee on the face of the patent. A copy of the '907 patent is attached as Exhibit 5.

217. Huawei declared the '907 patent essential to the ITU-T standards, including at least ITU-T Recommendations G.8275.1 (03/2020), ITU-T G.8275.1/Y.1369.1 (2020) Amendment 1 (11/20), ITU-T G.8275.1/Y.1369.1 (2020) Amendment 2 (06/21), and ITU-T G.8275.1/Y.1369.1 (2020) Amendment 3 (02/22).

218. Huawei, during negotiations, alleged that ADVA infringed and ADVA required a license to the '907 patent. Huawei identified this patent and its patent family as representative of ADVA's alleged infringement by virtue of practicing the ITU-T standards. Huawei provided a claim chart in support of its allegations mapping at least one claim to the ITU-T standards (G.8275.1 (03/2020), ITU-T G.8275.1/Y.1369.1 (2020) Amendment 1 (11/20), ITU-T G.8275.1/Y.1369.1 (2020) Amendment 2 (06/21), and ITU-T G.8275.1/Y.1369.1 (2020) Amendment 3 (02/22)).

219. Representative claim 1 of the '907 patent recites the following:

[1pre]	1. A method for detecting symmetry of optical fibers, performed by a boundary clock comprising a slave port and a passive port wherein the passive port is configured to run when the slave port runs normally; wherein the method comprises:
[1a]	receiving, by the boundary clock, a first timestamp message carrying a first timestamp via the slave port, and a second timestamp message carrying a second timestamp via the passive port, wherein the first timestamp message and the second timestamp message are sent by a first neighbor boundary clock and a second neighbor boundary clock of the boundary clock, respectively;

[1b]	calculating, by the boundary clock, a first time offset between the boundary clock and the first neighbor boundary clock according to the first timestamp;
[1c]	calculating, by the boundary clock, a second time offset between the boundary clock and the second neighbor boundary clock according to the second timestamp; and
[1d]	monitoring the optical fibers by comparing the first time offset and the second time offset, wherein the optical fibers are not symmetric if a difference value between the first time offset and the second time offset is larger than a first preset value.

220. The '907 patent is not essential to the identified or any other ITU-T standards and no claim of the '907 patent has been or is infringed, either directly, contributorily, or by inducement, literally or under the doctrine of equivalents, by ADVA or the purchasers of ADVA's products through the manufacture, use, importation, sale, and/or offer for sale of ADVA's products, at least because, by way of non-limiting example, ADVA's products and processes and the identified standard(s) do not satisfy the following claim limitation(s): [1pre], [1a], [1b], [1c], [1d].

221. There is thus a dispute between ADVA and Huawei concerning whether the '907 patent is actually essential to the ITU-T standards and whether certain of ADVA's products infringe one or more claims of the '907 patent. A definite, concrete, real, substantial, and justiciable controversy exists between ADVA and Huawei regarding the non-essentiality and non-infringement of the '907 patent with respect to Huawei's licensing demand. The controversy is of sufficient immediacy and reality to warrant the issuance of a declaratory judgment.

222. Under the Declaratory Judgment Act, 28 U.S.C. § 2201 *et seq.*, ADVA seeks a declaratory judgment that the '907 patent is not essential to the ITU-T standards, and that ADVA's products do not infringe and have not infringed any claim of the '907 patent.

**COUNT X: HUAWEI'S INFRINGEMENT OF U.S. PATENT NO. 8,280,249**

223. ADVA realleges and incorporates by reference the allegations set forth in the foregoing paragraphs.

224. On October 2, 2012, the United States Patent and Trademark Office duly and legally issued U.S. Patent No. 8,280,249 ("the '249 patent"), entitled "Pluggable Module With Integrated Traffic Management Functionality." A true and correct copy of the '249 patent is attached as Exhibit 6.

225. ADVA has owned the '249 patent since it issued. ADVA owns all rights, title, and interests in the '249 patent and holds all substantial rights pertinent to this suit, including the right to sue and recover for all past, current, and future infringement. ADVA Optical Networking SE is the current assignee of the '249 patent.

226. The inventions set forth in the '249 patent relate to a method for bidirectional transport of data via at least one optical fiber and the pluggable module includes an integrated data traffic management functionality.

227. On information and belief, Huawei uses, sells, offers to sell, and/or imports equipment compatible with the ITU's Telecommunication Standardization Sector ("ITU-T"), including the ITU-T's G.709: Interfaces for the optical transport network standard ("G.709" or "the G.709 Standard"),<sup>11</sup> OIF standards such as 400G-ZR and future 800G-ZR, IEEE standards such as 100G-ZR and multi-source agreements such as OpenZR, OpenZR+ and OpenROADM., including OTN products and equipment such as optical switching systems. For example, the digital frame or wrapper format adds a protocol overhead for operation, administration and maintenance functions as well as forward error correction. Also, the digital signal processor functions also

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<sup>11</sup> G.709, 709.1, 709.2, 709.3.

provide compensation of transmission impairments such as chromatic and polarization mode dispersion. The digital frame or wrapper format also adds a protocol overhead for operation, administration and maintenance functions as well as forward error correction. The digital signal processor functions also provide compensation of transmission impairments such as chromatic and polarization mode dispersion.

228. According to information published on the websites of Huawei and its resellers, Huawei devices that are designed to operate in accordance with the G.709 Standard are compliant with the G.709 Standard include, but are not limited to, data communication and transmission products, such as routers, switches, WDM equipment, OTN equipment, that use coherent optical modules and have an electrical and/or optical backplane. In addition, Huawei also uses, sells, offers to sell, and/or imports pluggable digital coherent optical transceiver modules (CFP-DCO, CFP2-DCO, QSFP-DD-DCO, and QSFP28-DCP).

229. On information and belief, the above-described features and functionality are incorporated into Huawei board lines, which utilize a digital signal processor: ECOM, LDGD, LDGS, LDM, LDMD, LDMS, LDX, LOA, LOG, LOM, LQG, LQM, LQMD, LQMS, LSQ, LSC, LSX, TN, LSX, LTX, LWX, TMX, ND2, NQ2, NS2, NS3, TDG, TDG, TEM28, THA, TOA, TOG, TQM, TQS, TQX, TSXL, CFP, CFP2, QSFP-DD, QSFP+, and QSFP28 Optical Modules (Accused Pluggable Products) and operate in conjunction with one or more of the following product lines: OptiX OSN 500, OptiX OSN 550, OptiX OSN 580, OptiX OSN 1500, OptiX OSN 1800, OptiX OSN 3500, OptiX OSN 3800, OptiX OSN 6800, OptiX OSN 7500, OptiX OSN 7500 II, OptiX OSN 8800, OptiX OSN 9560, and OptiX OSN 9800 series, which are multi-service OTN platforms.

230. According to information published on the websites of Huawei and its subsidiaries design, develop, and supply the Accused Pluggable Products for use, sale, offers to sell, and/or importation in the United States and in the Eastern District of Texas.

231. As set forth in detail below, the Accused Pluggable Products infringe at least method claim 14 of the '249 patent.

232. Claim 14 recites:

14. A method for bidirectional transport of data between host devices of a network via at least one optical fibre, comprising:

performing traffic management during transport of the optical data by a pluggable module,

wherein the pluggable module is attached to said optical fibre and is connected to a corresponding cage of one of said host devices and a traffic management during transport of the optical data is performed by said pluggable module,

wherein said pluggable module comprises an embedded communication channel for exchanging management data, administrative data and performance monitoring data between said pluggable module and a far end device,

wherein said far end device is a pluggable module, and

wherein said pluggable module performs protocol mapping functions between different types of data transport protocols of said data transported via at least one optical fibre connected to said pluggable module.

233. To the extent the preamble is considered to be limiting, the Accused Pluggable Products meet the preamble of claim 14 of the '249 patent. Specifically, Accused Pluggable Products perform a "method for bidirectional transport of data between host devices of a network via at least one optical fibre."

234. One representative example of Huawei's Accused Pluggable Products that performs this method is Huawei's TN18LSC board, which is pluggable into Huawei's 8800 series subracks.<sup>12</sup> On information and belief, the representative TN18LSC board is a smaller version of Huawei's TN17LSC, which is a more efficient version of Huawei's TN15LSC.

Board	TN17LSC	TN18LSC
Initial Version	V100R010C00	V100R010C10SPC300
General 8800 T64 Subrack	Y	Y
Enhanced 8800 T64 Subrack	Y	Y
General 8800 T32 Subrack	Y	Y
Enhanced 8800 T32 Subrack	Y	Y
8800 T16 Subrack	Y	Y
8800 Universal Platform Subrack	Y	Y
6800 Subrack	Y	N
3800 Chassis	N	N

(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).

235. The representative Huawei TN18LSC board has a digital coherent module that performs signal processing, FEC, traffic management of the transported data, and protocol mapping functions between different types of data transport protocols of said data transported data. On information and belief, the representative TN18LSC board receives optical data from the

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<sup>12</sup> Additional subracks and boards are products within the following Huawei product lines: OptiX OSN 500, OptiX OSN 550, OptiX OSN 580, OptiX OSN 1500, OptiX OSN 1800, OptiX OSN 3500, OptiX OSN 3800, OptiX OSN 6800, OptiX OSN 7500, OptiX OSN 7500 II, OptiX OSN 8800, OptiX OSN 9560, and OptiX OSN 9800 series.

network and provides that data to the subrack in another form. This process works in reverse as well. Another form of traffic management the digital coherent module provides is FEC (forward error correction) and dispersion compensation. The digital coherent module also performs certain optical transmission impairment mitigation techniques, such as compensation of chromatic and polarization mode dispersion. On information and belief, the representative TN18LSC board—via the digital coherent module(s)—performs OAM (operation administration and maintenance) functionalities, such as performance monitoring, default management, inter-device communication, configuration management and security management, and/or optical conversion with mapping and framing functions.

TN18LSC	(100 GBASE-4×25G)/(OTU4-4×28G)-10 km-CFP2	N/A	40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, ULH+, T5U)-100G CFP
	100G BASE-ER4-40 km-CFP2		40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM, LH, T62)-100G CFP
	100G BASE-SR10-100 m-CFP2		12000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM-Metro, T65)-100G CFP
			40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK (configurable FEC, coherent/wDCM, ULH+, TxA)-100G CFP
			<b>NOTE:</b>
			Configurable FEC types: SDFEC2, HFEC PLUS.
			In a coherent network, the recommended modulation format for the TxA module is QPSK.
			In a wDCM network, the modulation format can only be QPSK wDCM for the TxA module.
			The QPSK and QPSK wDCM modulation formats cannot interconnect with each other.

(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).

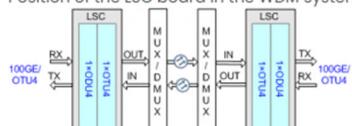
The WDM device has two sides:

Client Side: The Client's services such as SDH/IP/ATM are accessed from this side interface, also known as the business side.

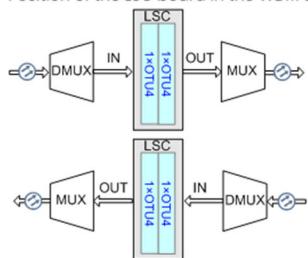
WDM Side: output the standard OTN color optical signal after processing the customer side signal.

The LSC board is a wavelength conversion board and applies to coherent systems. For the position of the LSC board in the WDM system, see figures below:

Position of the LSC board in the WDM system



Position of the LSC board in the WDM system (regeneration mode)



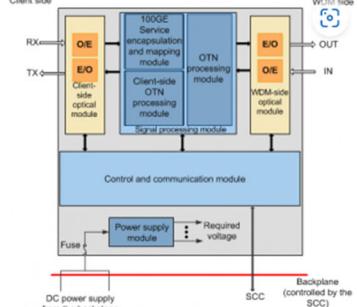
Only the TN17LSC/TN18LSC board supports the regeneration mode.

The LSC board consists of the client-side optical module, WDM-side optical module, **signal processing module**, control and communication module, and power supply module.

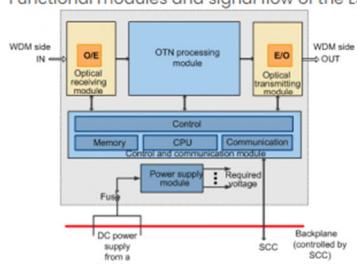
(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).

Figures below show the functional modules and signal flow of the LSC.

Functional modules and signal flow of the LSC board



Functional modules and signal flow of the LSC board (regeneration mode)



In this article, we will mainly explain the differences between TN17LSC and TN18LSC, which are both 100G OTU boards, in main functions, front panel, valid slots, mappings, variants, versions, substitutions, updates, optical modules.....

(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).

Board Name	Board Description
<b>TN12LDX</b>	<b>2 x 10 Gbit/s wavelength conversion unit</b>
<b>TN11LOA</b>	<b>8 x any-rate MUX OTU2 wavelength conversion board</b>
<b>TN12LOG</b>	<b>8 x Gigabit Ethernet unit</b>
<b>TN12LOM</b>	<b>8 x multi-service multiplexing &amp; optical wavelength conversion board</b>
<b>TN12LSC/TN13LSC/TN15LSC</b>	<b>100Gbit/s wavelength conversion board</b>
<b>TN17LSC/TN18LSC</b>	
<b>TN17LSCM</b>	<b>100Gbit/s wavelength conversion board</b>
<b>TN11LSQ</b>	<b>1 x 40 Gbit/s wavelength conversion board</b>
<b>TN13LQM</b>	<b>4 x multi-rate (100Mbit/s-2.5Gbit/s) wavelength conversion unit</b>
<b>TN12LSX/TN13LSX/TN14LSX</b>	<b>1 x 10 Gbit/s wavelength conversion board</b>
<b>TN11LTX/TN12LTX</b>	<b>10 x 10Gbit/s Service multiplexing &amp; optical wavelength conversion board</b>
<b>TN15LTX/TN17LTX</b>	
<b>TN12LWXS</b>	<b>arbitrary rate (16Mbit/s-2.7Gbit/s) wavelength conversion board</b>
<b>TN52TOM</b>	<b>8 x multi-rate ports service processing board</b>
<b>TN12TMX</b>	<b>4-channel STM-16/OC-48/OTU1 asynchronous mux OTU2 wavelength conversion board</b>
<b>TN15LSXL</b>	<b>40 Gbit/s wavelength conversion board</b>
<b>TN11LQCP</b>	<b>4*100Gbit/s or 16*10Gbit/s Service Programmable Wavelength Conversion Board</b>
<b>TN11LDC/TN12LDC</b>	<b>2 x 100Gbit/s Service Multiplexing Into OTUC2 Wavelength Conversion Board</b>

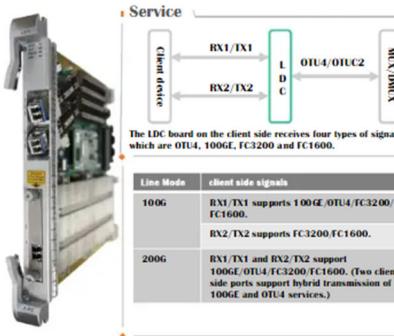
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(<https://www.scribd.com/document/603013197/OTC119101-OptiX-OSN-9800-Hardware-Description>).

## Optical Transponder Units-LDC



Function	
ALS	Supported when non-OTN services are supported
Transc. wavelength	Supported
PRBS	Supported
ESG	Supported
LPT	Not Supported
FEC	Client-Side: FEC (OTU4) RS-FEC (100GE, FC3200) SDM-FEC: R
Latency measurement	Supported
IEEE 1588v2	Not supported
Physical clock	The board supports synchronous Ethernet transparent transmission instead of synchronous Ethernet processing.
Protection	Client 1+1 protection, intra-board 1+1 protection
Loopback	WDM side, client side, and ODUk (ODU4 or ODUflex) channel

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## Optical Transponder Units-LDC (Cont.)

**Module**

<b>Client-Side</b>	
(100GBASE-4x25G)/(OTU4-4x25G)-LR4-10km-QSFP28 (100GBASE-4x25G)-CLR4-2km-QSFP28 (100GBASE-4x25G)-SR4-100m-QSFP28 112.2Gbit/s Multirate-0.1km-QSFP28	
<b>WDM-Side</b>	
<ul style="list-style-type: none"> <li>• 20000ps/nm-Extended C band-Tunable Wavelength-ePDM-16QAM (flexrate, coherent, Region, TS1)-200G CFP (flexrate: 200G ePDM-16QAM (SD FEC-R, 20000ps/nm) or 100G ePDM-QPSK (wDCM, SD FEC-R, 55000ps/nm) )</li> <li>• 40000ps/nm-Extended C band-Tunable Wavelength-ePDM-16QAM (flexrate, flexcode, coherent, Metro, T15)-200G CFP (flexrate and flexcode: 200G ePDM-16QAM (SD FEC) or 100G ePDM-QPSK(wDCM, SD FEC2) or 100G ePDM-QPSK(SD FEC2) )</li> </ul>	

**RTU**

Model	RTU Description
RTU-UNSDRTUC01	OSN 9800/SS00 Line Port Enable RTU for 200G CFP Port
RTU-UNSDRTUC02	OSN 9800/SS00 Line Capacity RTU for 200G CFP Port(Per 100G)
RTU-UNSDRTUQ01	OSN 9800/SS00 Client Port Enable RTU for 100G QSFP Port

**Mechanical Specifications**

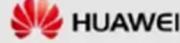
Weight:	Typical Power Consumption	Maximum Power Consumption
1.8 kg (3.97 lb.)	90 W	100 W

**Slots**

<b>Single-slot Board (8800 Slots)</b>	
OptiX OSN SS00 164 subrack	IU1 to IU8, IU11 to IU42, IU45 to IU68
OptiX OSN SS00 132 subrack	IU1 to IU8, IU12 to IU27, IU29 to IU36
OptiX OSN SS00 116 subrack	IU11 to IU18
OptiX OSN SS00 UPS	IU1 to IU16
<b>Single-slot Board (9800 Slots)</b>	
OptiX OSN 9800 UPS	IU1 to IU16

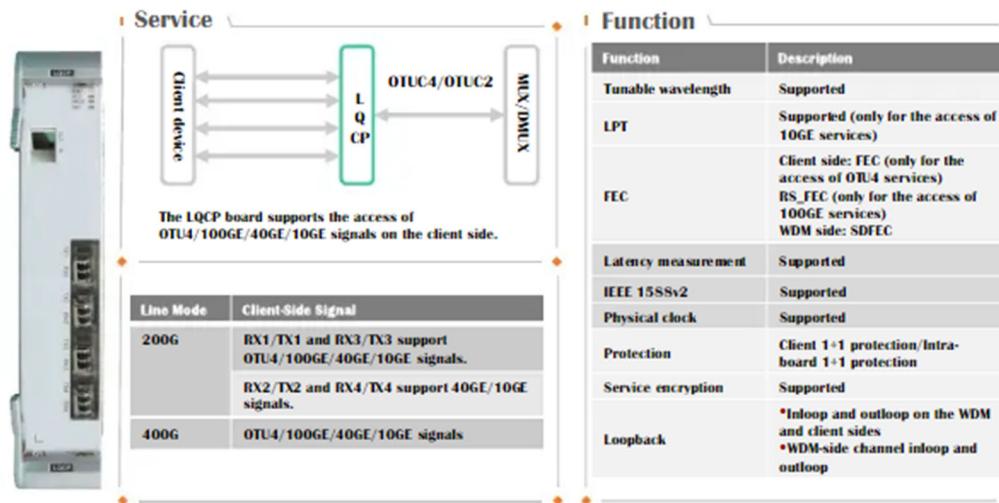
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## Optical Transponder Units-LQCP



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## Optical Transponder Units-LQCP (*Cont.*)

<p><b>Optical Modules</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="background-color: #cccccc;">Client-Side</th> </tr> <tr> <td colspan="2"> <b>100GE/OTU4:</b>            (100GBASE-4x25G)/(OTU4-4x2SG)-LR4-10km-QSFP28         </td> </tr> <tr> <td colspan="2"> <b>100GE:</b>            (100GBASE-4x25G)-CLR4-2km-QSFP28            QSFP28-100G-S50nm-0.1km-MM-01         </td> </tr> <tr> <td colspan="2"> <b>40GE:</b>            40GBASE-LR4-10km-QSFP+         </td> </tr> <tr> <td colspan="2"> <b>10GE:</b>            (40GBASE-ESR4/4x10GBASE-SR)-0.3km-QSFP+            4x(10GBASE-LR)-10km-QSFP+         </td> </tr> <tr> <th colspan="2" style="background-color: #cccccc;">WDM-Side</th> </tr> <tr> <td colspan="2">           Extended C band-Tunable wavelength-ePDM-16QAM (SD FEC)-PIN            (Rate configurable: 400G PDM-16QAM or 200G PDM-SQAM/QPSK (SD FEC))         </td> </tr> </table>	Client-Side		<b>100GE/OTU4:</b> (100GBASE-4x25G)/(OTU4-4x2SG)-LR4-10km-QSFP28		<b>100GE:</b> (100GBASE-4x25G)-CLR4-2km-QSFP28 QSFP28-100G-S50nm-0.1km-MM-01		<b>40GE:</b> 40GBASE-LR4-10km-QSFP+		<b>10GE:</b> (40GBASE-ESR4/4x10GBASE-SR)-0.3km-QSFP+ 4x(10GBASE-LR)-10km-QSFP+		WDM-Side		Extended C band-Tunable wavelength-ePDM-16QAM (SD FEC)-PIN (Rate configurable: 400G PDM-16QAM or 200G PDM-SQAM/QPSK (SD FEC))		<p><b>Mechanical Specifications</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">Weight</th> <th style="background-color: #cccccc;">Typical Power Consumption</th> <th style="background-color: #cccccc;">Maximum Power Consumption</th> </tr> </thead> <tbody> <tr> <td>2.58 kg (5.69 lb.)</td> <td>400G: 172 W 200G SQAM: 147 W 200G QPSK: 149 W</td> <td>400G: 182 W 200G SQAM: 155 W 200G QPSK: 157 W</td> </tr> </tbody> </table> <p><b>Slots</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #cccccc;">Two-slot board (the right-side one)</th> </tr> </thead> <tbody> <tr> <td style="width: 25%;">SS00T64</td> <td>IU2 to IU8, IU12 to IU18, IU20 to IU26, IU28 to IU34, IU36 to IU42, IU46 to IU52, IU54 to IU60, IU62 to IU68</td> </tr> <tr> <td>SS00T32</td> <td>IU2 to IU8, IU13 to IU19, IU21 to IU27, IU30 to IU36</td> </tr> <tr> <td>SS00T16</td> <td>IU2 to IU8, IU12 to IU18</td> </tr> <tr> <td>SS00UPS</td> <td>IU2 to IU6</td> </tr> <tr> <td>9800UPS</td> <td>IU2 to IU16</td> </tr> </tbody> </table>	Weight	Typical Power Consumption	Maximum Power Consumption	2.58 kg (5.69 lb.)	400G: 172 W 200G SQAM: 147 W 200G QPSK: 149 W	400G: 182 W 200G SQAM: 155 W 200G QPSK: 157 W	Two-slot board (the right-side one)		SS00T64	IU2 to IU8, IU12 to IU18, IU20 to IU26, IU28 to IU34, IU36 to IU42, IU46 to IU52, IU54 to IU60, IU62 to IU68	SS00T32	IU2 to IU8, IU13 to IU19, IU21 to IU27, IU30 to IU36	SS00T16	IU2 to IU8, IU12 to IU18	SS00UPS	IU2 to IU6	9800UPS	IU2 to IU16
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SS00UPS	IU2 to IU6																																
9800UPS	IU2 to IU16																																

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 HUAWEI

(<https://www.scribd.com/document/603013197/OTC119101-OptiX-OSN-9800-Hardware-Description>).

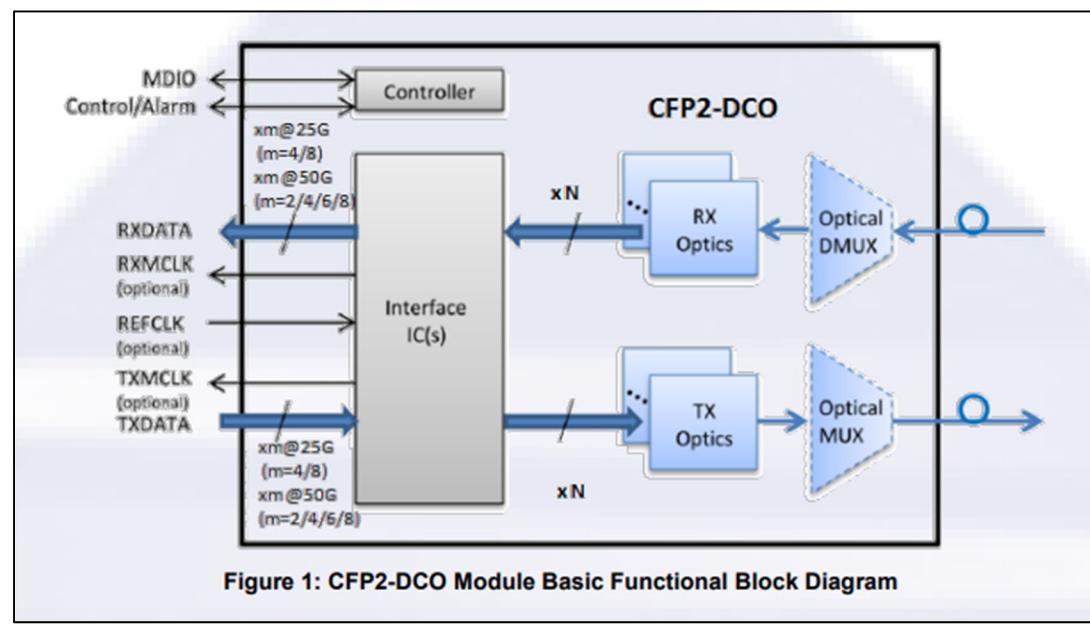
236. The Accused Pluggable Products meet the first limitation of claim 14 of the '249 patent. Specifically, Accused Pluggable Products perform a method that includes “performing traffic management during transport of the optical data by a pluggable module” and the “pluggable module is attached to said optical fibre and is connected to a corresponding cage of one of said host devices and a traffic management during transport of the optical data is performed by said pluggable module” and includes “an embedded communication channel for exchanging management data, administrative data and performance monitoring data between said pluggable module and a far end device.”

## 8 Module Management Interface Description

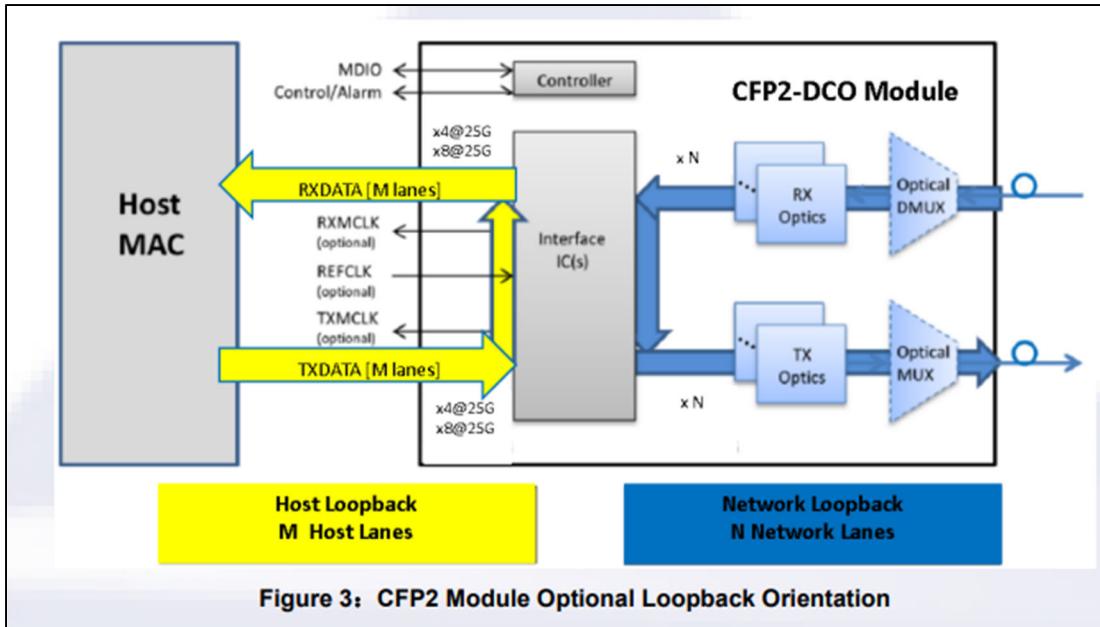
The CFP2-DCO module utilizes MDIO IEEE Std 802.3<sup>TM</sup>-2015 clause 45 for its management interface. The CFP2-DCO MDIO implementation is defined in a separated document entitled, "CFP MSA Management Interface Specification" [2]. When multiple CFP2-DCO modules are connected via a shared MDIO bus, a particular CFP2-DCO module can be selected by using the Physical Port Address pins.

The higher symbol rates associated with coherent modems points to the utility for a high bandwidth management interface to the modem, for example: accessing the modem overhead data, modem performance monitoring and diagnostic data, and client statistics in contrast to the limited bandwidth access to these facilities possible with the MDIO management interface. This IA allocates additional high-speed signal pins (2-3, 5-6, 47-48, 50-51) to provide an option for such a high-speed interface

(<https://www.oiforum.com/wp-content/uploads/2019/01/OIF-CFP2-DCO-01.0.pdf>).



*Id.*



*Id.*



(<https://www.scribd.com/document/433057509/Transport-Network>).



(<https://www.scribd.com/document/433057509/Transport-Network>).

OptiX OSN 8800 Intelligent Optical Transport Platform		11 Technical Specifications	
Product Description			
<b>Board</b>	<b>Client-Side Pluggable Optical Module</b>	<b>WDM-Side Fixed Optical Module</b>	<b>WDM-Side Pluggable Optical Module</b>
TN18L SC	(100 GBASE-4×25G)/(OTU4-4×28G)-10 km-CFP2 100G BASE-ER4-40 km-CFP2 100G BASE-SR10-100 m-CFP2	N/A	40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, ULH+, T5U)-100G CFP 40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2 , wDCM, LH, T62)-100G CFP 12000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2 , wDCM-Metro, T65)-100G CFP

(<https://www.scribd.com/document/475585178/descripcionProducto-pdf>).

IA # OIF-CFP2-DCO-01.0				
PIN#	NAME	I/O	Logic	Description
1	GND			
2	(TX_MCLKn) or Vendor_Out0n	O	CML	For optical waveform testing or Module vendor output
3	(TX_MCLKp) or Vendor_Out0p	O	CML	For optical waveform testing or Module vendor output
4	GND			
5	Vendor_In0n	I	CML	Module vendor input. Vendor specific.
6	Vendor_In0p	I	CML	Module vendor input. Vendor specific.
7	3.3V_GND			3.3V Module Supply Voltage Return Ground, can be separate or tied together with Signal Ground
8	3.3V_GND			
9	3.3V			3.3V Module Supply Voltage
10	3.3V			
11	3.3V			
12	3.3V			
13	3.3V_GND			
14	3.3V_GND			
15	VND_IO_A	I/O		Module Vendor I/O A. Do Not Connect!
16	VND_IO_B	I/O		Module Vendor I/O B. Do Not Connect!
17	PRG_CNTL1	I	LVC MOS wiPUR	Programmable Control 1 set over MDIO, MSA Default: TRXC_RSTn, TX & RX ICs reset, "0": reset, "1" or NC: enabled = not used
18	PRG_CNTL2	I	LVC MOS wiPUR	Programmable Control 2 set over MDIO, MSA Default: Hardware Interlock LSB, "00": s9W, "01": s12W, "10": s15W, "11" or NC: s18W = not used
19	PRG_CNTL3	I	LVC MOS wiPUR	Programmable Control 3 set over MDIO, MSA Default: Hardware Interlock MSB, "00": s9W, "01": s12W, "10": s15W, "11" or NC: s18W = not used
20	PRG_ALRM1	O	LVC MOS	Programmable Alarm 1 set over MDIO, MSA Default: HIPWR_ON, "1": module power up completed, "0": module not high powered up
21	PRG_ALRM2	O	LVC MOS	Programmable Alarm 2 set over MDIO, MSA Default: MOD_READY, "1": Ready, "0": not Ready
22	PRG_ALRM3	O	LVC MOS	Programmable Alarm 3 set over MDIO, MSA Default: MOD_FAULT, fault detected, "1": Fault, "0": No Fault
23	GND			
24	TX_DIS	I	LVC MOS wiPUR	Transmitter Disable for all lanes, "1" or NC = transmitter disabled, "0" = transmitter enabled
25	RX_LOS	O	LVC MOS	Receiver Loss of Optical Signal, "1": low optical signal, "0": normal condition
26	MOD_LOPWR	I	LVC MOS wiPUR	Module Low Power Mode. "1" or NC: module in low power (safe) mode, "0": power-on enabled
27	MOD_ABS	O	GND	Module Absent. "1" or NC: module absent, "0": module present, Pull Up Resistor on Host
28	MOD_RSTn	I	LVC MOS wiPDR	Module Reset. "0": resets the module, "1" or NC = module enabled, Pull Down Resistor in Module
29	GLB_ALRMn	O	LVC MOS	Global Alarm. "0": alarm condition in any MDIO Alarm register, "1": no alarm condition, Open Drain, Pull Up Resistor on Host

(<https://www.oiforum.com/wp-content/uploads/2019/01/OIF-CFP2-DCO-01.0.pdf>).

IA # OIF-CFP2-DCO-01.0			
30	GND		
31	MDC	I	1.2V CMOS Management Data Clock (electrical specs as per IEEE Std 802.3-2012)
32	MDIO	I/O	1.2V CMOS Management Data I/O bi-directional data (electrical specs as per IEEE Std 802.3-2012)
33	PRTADR0	I	1.2V CMOS MDIO Physical Port address bit 0
34	PRTADR1	I	1.2V CMOS MDIO Physical Port address bit 1
35	PRTADR2	I	1.2V CMOS MDIO Physical Port address bit 2
36	VND_IO_C	I/O	Module Vendor I/O C. Do Not Connect!
37	VND_IO_D	I/O	Module Vendor I/O D. Do Not Connect!
38	VND_IO_E	I/O	Module Vendor I/O E. Do Not Connect!
39	3.3V_GND		
40	3.3V_GND		
41	3.3V		3.3V Module Supply Voltage
42	3.3V		
43	3.3V		
44	3.3V		
45	3.3V_GND		
46	3.3V_GND		
47	Vendor_In1n	I	CML Module vendor input
48	Vendor_In1p	I	CML Module vendor input
49	GND		
50	(RX_MCLKn) or Vendor_Out1n	O	CML For optical waveform testing or Module vendor output
51	(RX_MCLKp) or Vendor_Out1p	O	CML For optical waveform testing or Module vendor output
52	GND		

Table 7: CFP2-DCO Bottom Row Pin Description for N x 25Gbit/s applications

(<https://www.oiforum.com/wp-content/uploads/2019/01/OIF-CFP2-DCO-01.0.pdf>).



IA # OIF-CFP2-DCO-01.0

**Working Group:**

Physical and Link Layer (PLL) Working Group  
Carrier Working Group

**TITLE:**

Implementation Agreement for CFP2-Digital Coherent Optics Module  
IA OIF-CFP2-DCO-01.0

**SOURCE:**

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**ABSTRACT:** This contribution is the adopted baseline text for the CFP2 Digital Coherent Optics Module Implementation Agreement. OIF2016.297.07 is the original project start document for this project.

(<https://www.oiforum.com/wp-content/uploads/2019/01/OIF-CFP2-DCO-01.0.pdf>).

237. The Accused Pluggable Products meet the second limitation of claim 14 of the '249 patent. Specifically, the Accused Pluggable Products practice a method where the “far end device is a pluggable module.”

Two slots house one TN17LSC board, one slot house one TN18LSC board.  
Valid slots for the TN17LSC board:

Product	Valid Slots
OptiX OSN 8800 T64 subrack	IU1-IU7, IU11-IU17, IU19-IU25, IU27-IU33, IU35-IU41, IU45-IU51, IU53-IU59, IU61-IU67
OptiX OSN 8800 T32 subrack	IU1-IU7, IU12-IU18, IU20-IU26, IU29-IU35
OptiX OSN 8800 T16 subrack	IU1-IU7, IU11-IU17
OptiX OSN 8800 universal platform subrack	IU1-IU15
OptiX OSN 6800 subrack	IU1-IU16

The TN17LSC board occupies two slots. The rear connector for connecting the TN17LSC board to the backplane is located in the left slot of the two slots. Therefore, the slot number for the TN17LSC board is displayed as the left slot of the two slots on the NMS.

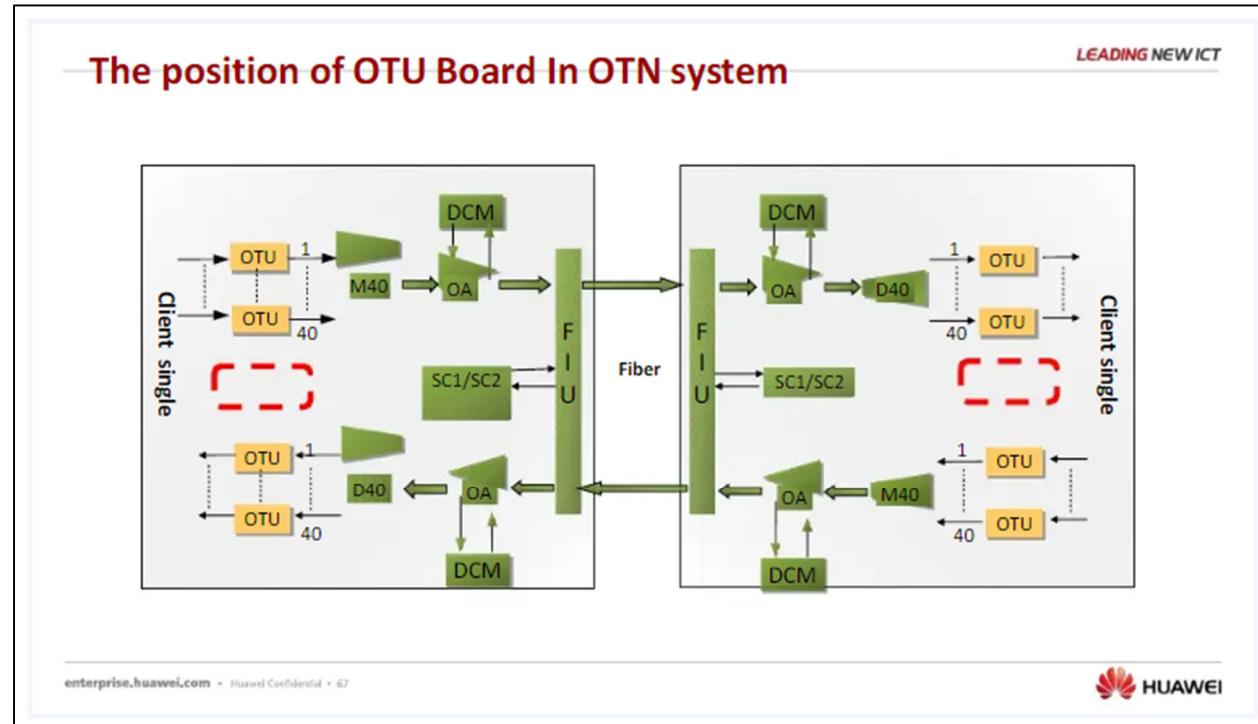
For example, if the TN17LSC board is housed in the slots IU1, and IU2, then the slot number for the TN17LSC board is displayed as IU1 on the NMS.

When TN17LSC boards are used as regeneration boards and ESC communication is required, the transmit-end and receive-end TN17LSC boards for the same wavelength must be configured in paired slots. This restriction does not apply to other scenarios.

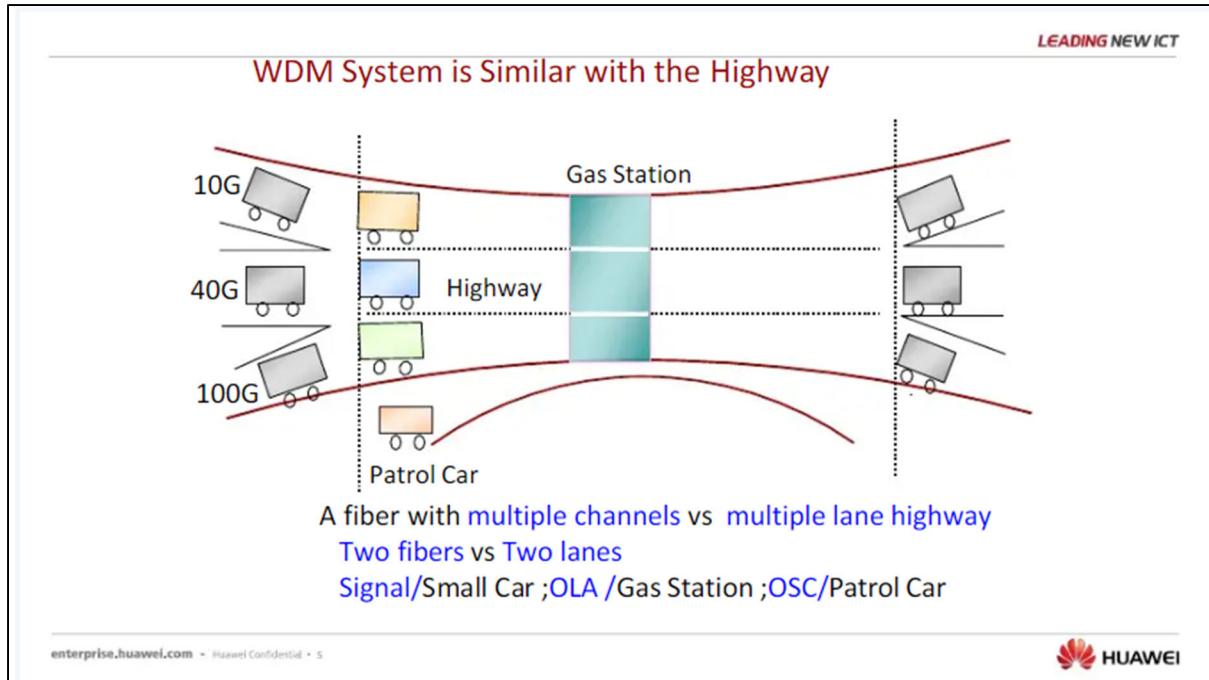
Valid slots for the TN18LSC board

Product	Valid Slots
OptiX OSN 8800 T64 subrack	IU1-IU8, IU11-IU18, IU19-IU26, IU27-IU34, IU35-IU42, IU45-IU52, IU53-IU60, IU61-IU68
OptiX OSN 8800 T32 subrack	IU1-IU8, IU12-IU19, IU20-IU27, IU29-IU36
OptiX OSN 8800 T16 subrack	IU1-IU18
OptiX OSN 8800 universal platform subrack	IU1-IU16

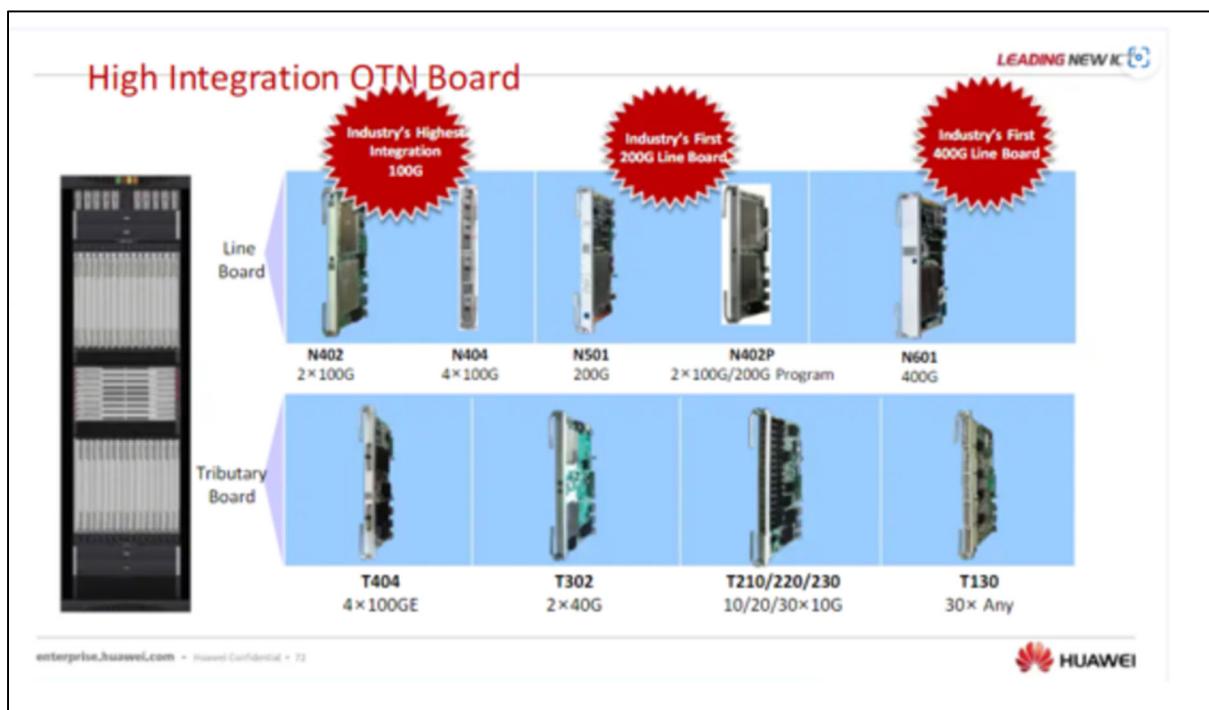
(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).



(<https://www.scribd.com/presentation/449317096/Huawei-DWDM-Basic-OTN-Product-Intro>).



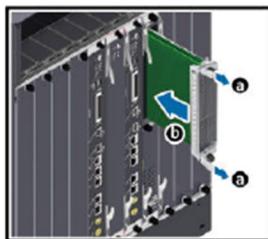
(<https://www.scribd.com/presentation/449317096/Huawei-DWDM-Basic-OTN-Product-Intro>).



(<https://www.scribd.com/presentation/449317096/Huawei-DWDM-Basic-OTN-Product-Intro>).

 NOTE

- Before you install a subcard, remove redundant guide rails from the board and store them for future use.
- Before inserting a service processing subcard (SPC), pull the ejector levers on both sides of the subcard outwards and push the subcard inwards (as shown in the following figure) until it is fully inserted. Then close the two ejector levers.



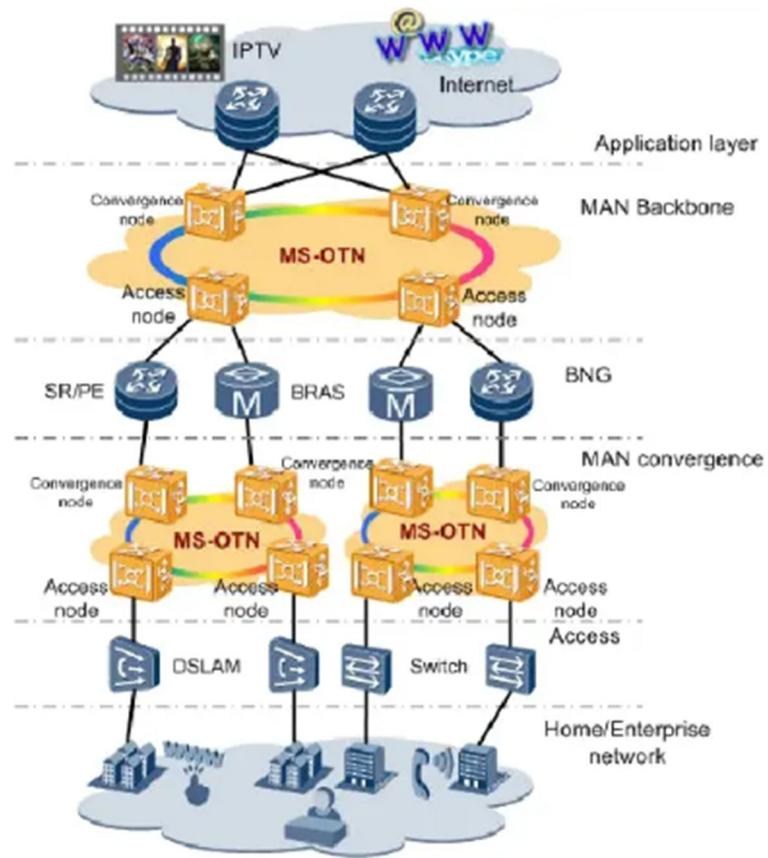
1. Remove the filler panel from the board.
2. Smoothly insert the subcard into the board along the guide rail.
3. Use a Phillips screwdriver to fasten the captive screws to the board.

**Figure 3-33** Installing a subcard



----End

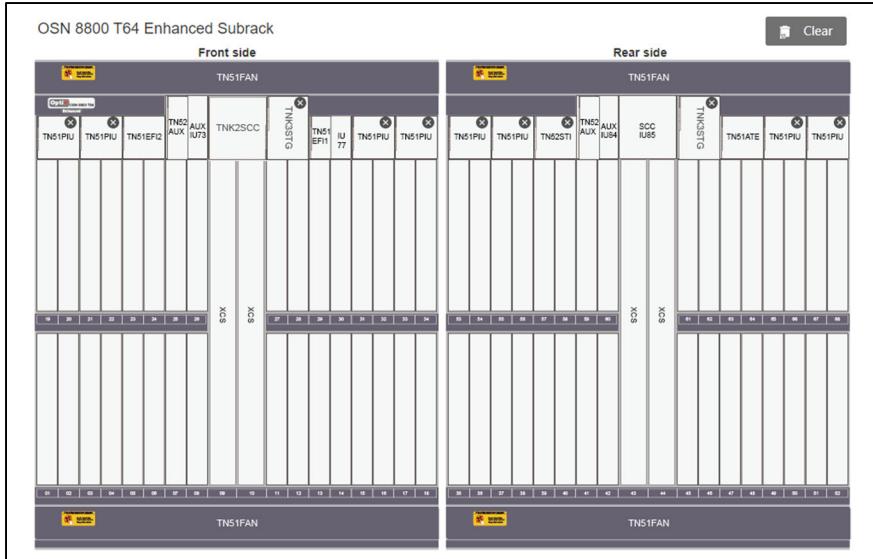
(<https://support.huawei.com/enterprise/br/doc/EDOC1100023969/cf283d7e/installing-boards-and-subcards>).

**Figure 1-5 MAN broadband network**

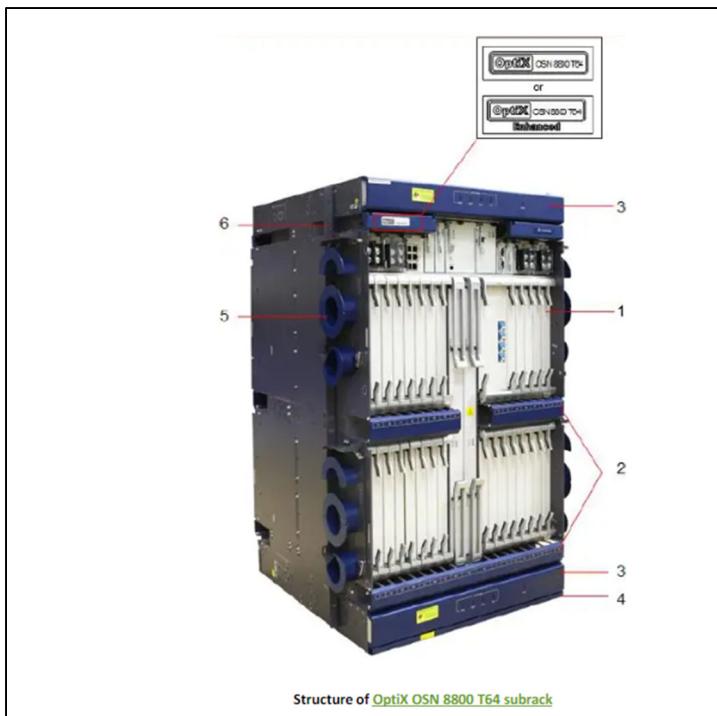
### 1.3.3 Leased Line Transmission: Services of Various Types and Rates

Leased lines are important for network operation. The multi-service OTN (MS-OTN) can carry leased line services of various types and rates and has many advantages, such as high bandwidth, high reliability, high security, high flexibility, and low costs.

E1 services were mainstream leased line services. With the wider deployment of information technologies, new applications, such as video conference and cloud computing, are rapidly developed, and FE and GE services are gradually becoming the mainstream private line



([https://info.support.huawei.com/ta/wdmhdcfg/en\\_US/transport\\_configuration\\_assistant/wdm/t64\\_enhanced/configCal\\_T64\\_Enhanced.html](https://info.support.huawei.com/ta/wdmhdcfg/en_US/transport_configuration_assistant/wdm/t64_enhanced/configCal_T64_Enhanced.html)).



(<https://www.router-switch.com/media/upload/product-pdf/huawei-optix-osn-8800-and-boards-datasheet.pdf>).



(<https://www.router-switch.com/media/upload/product-pdf/huawei-optix-osn-8800-and-boards-datasheet.pdf>).

238. The Accused Pluggable Products meet the third limitation of claim 14 of the '249 patent. Specifically, the “pluggable module performs protocol mapping functions between different types of data transport protocols of said data transported via at least one optical fibre connected to said pluggable module.”

239. As shown above in the second claim element, the Accused Pluggable Products are adapted to be plugged into a host line card/board which is plugged into a subrack, e.g., the OptiX OSN 8800 subrack, which corresponds to the claimed “cage of one of said host devices.” Of course, the subracks from the following product lines also correspond to a cage of one of said host devices”: OptiX OSN 500, OptiX OSN 550, OptiX OSN 580, OptiX OSN 1500, OptiX OSN 1800, OptiX OSN 3500, OptiX OSN 3800, OptiX OSN 6800, OptiX OSN 7500, OptiX OSN 7500 II, OptiX OSN 8800, OptiX OSN 9560, and OptiX OSN 9800.

240. Huawei’s representative TN18LSC board has a digital coherent module that performs a traffic management of said transported data. The representative TN18LSC receives optical data from the network and, in some instances, provides that data to the subrack in another form. This process works in reverse as well. Another form of traffic management provided by TN18LSC’s digital coherent module is FEC (forward error correction) and dispersion compensation. The digital coherent module also performs certain transmission impairment mitigation techniques, such as compensation of chromatic and polarization mode dispersion. On information and belief, the representative TN18LSC board performs OAM (operation administration and maintenance) functionalities, such as performance monitoring, default management, inter-device communication, configuration management and security management, and/or optical conversion with mapping and framing functions.

5. Variants		
Available variants of the TN17LSC board		
Variant	WDM-Side Fixed Optical Module	FEC Encoding
T50	150000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2, Enhanced)-PIN	SDFEC2
T51	150000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2)-PIN	SDFEC2
T52	55000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2)-PIN	SDFEC2
T53	40000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2)-PIN	SDFEC2
T61	150000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM)-PIN	SDFEC2
T62	40000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM, LH)-PIN	SDFEC2
T65	12000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2,wDCM-Metro)-PIN	SDFEC2
T58	120000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2)-PIN	SDFEC2
T68	120000 ps/nm-C Band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM)-PIN	SDFEC2

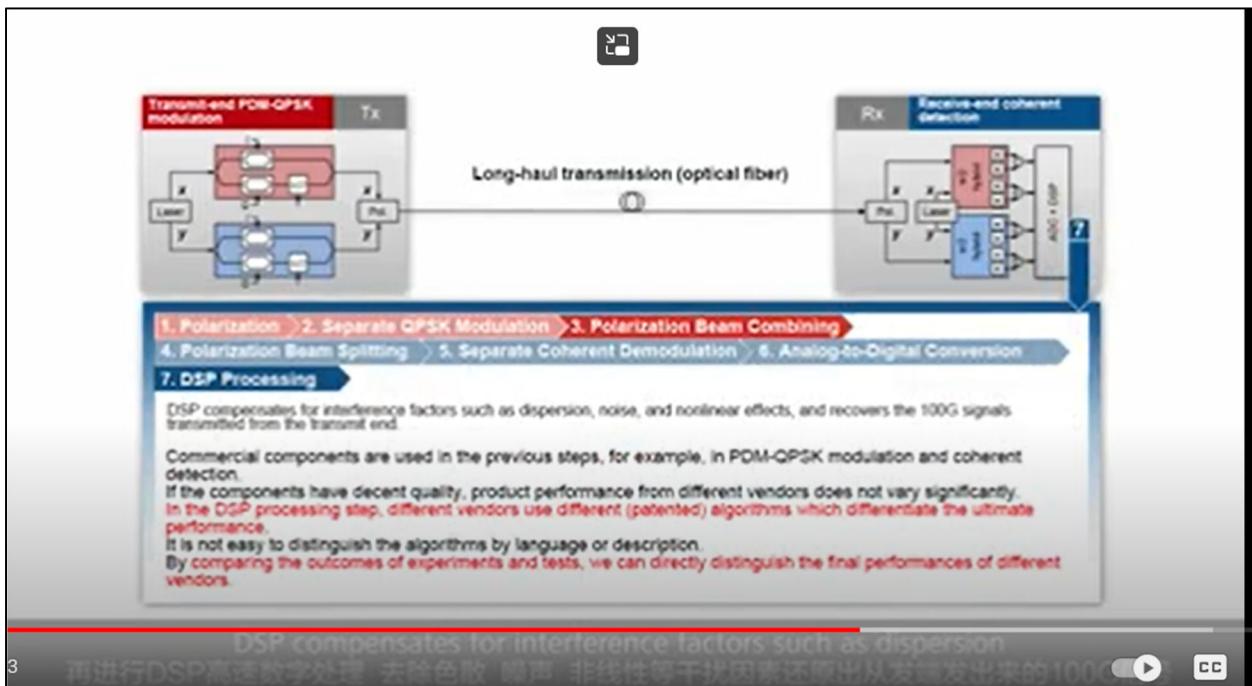
**NOTE:**

The T65 variant of the TN17LSC board applies to metro networks, and its WDM-side module requires the use of the same wavelength at the transmit and receive ends and does not support wavelength change by configuring regeneration boards.

Table 5 Available variants of the TN18LSC board		
Variant	WDM-Side Pluggable Optical Module	FEC Encoding
T5U	40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, UH+, T5U)-100G CFP	SDFEC2
T62	40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM, LH, T62)-100G CFP	SDFEC2
T65	12000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK(SDFEC2, wDCM-Metro, T65)-100G CFP	SDFEC2
TxA	40000ps/nm-Extended C band-Tunable Wavelength-ePDM-QPSK (configurable FEC, coherent/wDCM, ULH+, TxA)-100G CFP	SDFEC2, HFEC PLUS

(<https://www.telecomate.com/huawei-otu-boards-tn17lsc-vs-tn18lsc>).



(<https://www.youtube.com/watch?v=gRSCCd7Wsxo> (“DSP compensates for interference factors such as dispersion noise and nonlinear effects and recovers the 100g signals transmitted from the transmit.”)).

Function	Description
ALS	Supported when non-OTN services are supported
Tunable wavelength	Supported
PRBS	Supported
IEEE 1588v2	Not Supported
ESC	Supported
LPT	Not Supported
FEC coding	Client side : FEC (Only for OTU4) WDM side : SDFEC2
Latency measurement	Supported
Protection scheme	Client 1+1 /Intra-board 1+1 protection

WDM side
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2, ULH+, T5U)-100G CFP
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2 , wDCM, LH, T62)-100G CFP
12000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2 , wDCM-Metro, T65)-100G CFP
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK (configurable FEC, coherent/wDCM, ULH+, TxA)-100G CFP
NOTE: Configurable FEC types: SDFEC2, HFEC PLUS. In a coherent network, the recommended modulation format for the TxA module is QPSK.
In a wDCM network, the modulation format can only be QPSK wDCM for the TxA module. The QPSK and QPSK wDCM modulation formats cannot interconnect with each other.

(<https://actfornet.com/store/tn18lsc-osn8800-optical-transponder-unit.html>).

FEC is a part of auto-negotiation on an interface. If auto-negotiation is enabled on an interface, the local and remote interfaces negotiate to enable or disable FEC. If auto-negotiation is disabled on an interface, the default FEC mode is used. You can configure RS-FEC, Base-R FEC, or none FEC (disabling FEC) on an interface based on the interface's support for FEC. If FEC is enabled at one end of a link, this function must also be enabled at the other end of the link. If both a 25GE interface on the device and the remote interface support Base-R FEC and RS-FEC, the interfaces work in RS-FEC mode when they work in auto-negotiation mode.

When the negotiation status of interfaces at both ends of a link is not affected, pay attention to the following points:

- When the QSFP28-100G-LR4 optical module is used, the FEC function is disabled by default according to IEEE 802.3.
- When a QSFP-100G-ER4-Lite optical module is used, the FEC function is enabled by default. When a QSFP-100G-ER4-Lite optical module is connected to a standard 100GBASE-ER4 optical module (such as CFP-100G-ER4 and CFP2-100G-ER4), the FEC function needs to be disabled.
- When other QSFP28 optical modules excluding the QSFP28-100G-LR4 are used, the FEC function is enabled by default. Do not disable the FEC function; otherwise, error packets may be generated.

If an interface has been configured as a stack member interface, the FEC configuration command cannot be run on the interface. Similarly, if the FEC configuration command has been run on an interface, the interface cannot be configured as a stack member interface.

(<https://support.huawei.com/enterprise/en/doc/EDOC1100137939/246e8ff0/configuring-fec>).

 **NOTE**

- The default FEC mode on an interface varies according to the device model and connection medium. Interfaces at both ends of a link must work in the same FEC mode; otherwise, the interfaces do not go Up. If their FEC modes are different, configure the same FEC mode on the interfaces when they work in non-auto-negotiation mode. You can run the **display interface** command in any view or the **display this interface** command in the interface view to check whether the FEC function is enabled on an interface based on the **Fec** field in the command output.
- The FEC mode can be changed without the need to disable auto-negotiation on 100GE interfaces of the CE8860EI only when 100GE copper cables are installed on the interfaces. For 25GE interfaces of the CE8860EI and other switches excluding the CE8860EI, FEC mode can be changed only after auto-negotiation is disabled.
- When 25GE interfaces are interconnected, you are advised to enable FEC at both ends of the link to reduce the transmission bit error rate of the physical link. Otherwise, error packets may be generated.

(<https://support.huawei.com/enterprise/en/doc/EDOC1100137939/246e8ff0/configuring-fec>).

241. On information and belief, Huawei's representative TN18LSC board performs payload mapping or overhead mapping. The transport protocols comprise at least SDH, SONET, Ethernet, SAN, OTN, and Video data transport protocol.

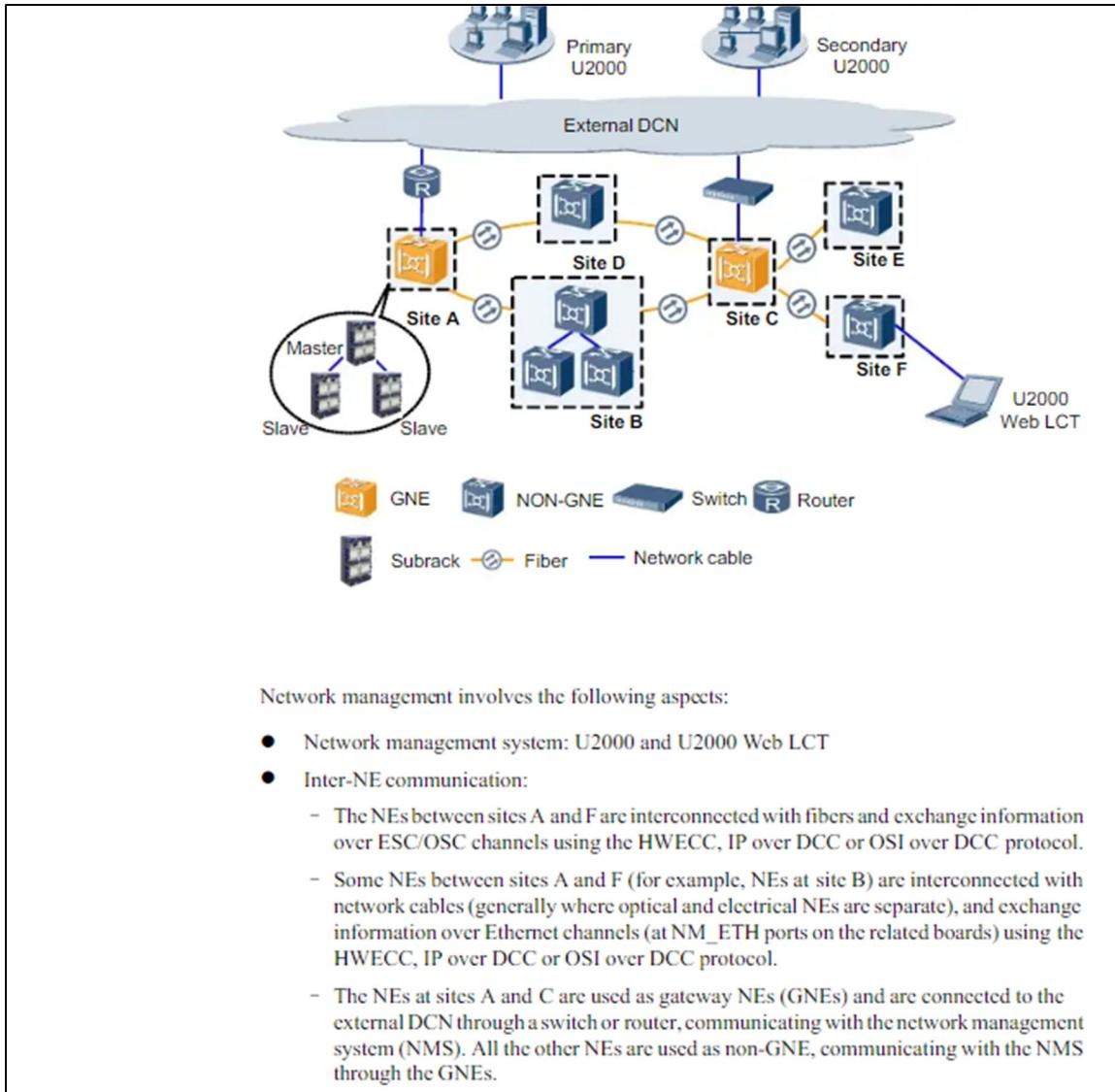
<b>Service types supported</b>	SDH, SONET, Ethernet, SAN, OTN, Video
<b>Line rate</b>	2.5 Gbit/s, 10 Gbit/s, 40 Gbit/s, 100 Gbit/s, 200 Gbit/s, 400 Gbit/s
<b>Supported pluggable optical modules</b>	eSFP, SFP+, XFP, CFP, CFP2, QSFP28, QSFP+

(<https://www.router-switch.com/media/upload/product-pdf/huawei-optix-osn-8800-and-boards-datasheet.pdf>).

TN18LSC	100 Gbit/s wavelength conversion board	Y	Y	Y	Y	Y	Y
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(<https://www.router-switch.com/media/upload/product-pdf/huawei-optix-osn-8800-and-boards-datasheet.pdf>).

242. On information and belief, the digital coherent module is programmable and allows for configurable protocol mapping.



(<https://www.scribd.com/document/390543966/osn-8800-6800-3800-v100r006c03-installing-operating-and-maintaining-your-network>).

Function	Description
ALS	Supported when non-OTN services are supported
Tunable wavelength	Supported
PRBS	Supported
IEEE 1588v2	Not Supported
ESC	Supported
LPT	Not Supported
FEC coding	Client side : FEC (Only for OTU4) WDM side : SDFEC2
Latency measurement	Supported
Protection scheme	Client 1+1 /Intra-board 1+1 protection

WDM side
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2, ULH+, T5U)-100G CFP
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2 , wDCM, LH, T62)-100G CFP
12000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK(SDFEC2 , wDCM-Metro, T65)-100G CFP
40000ps/nm-Extended C band-Tunable WavelengththePDM-QPSK (configurable FEC, coherent/wDCM, ULH+, TxA)-100G CFP
NOTE: Configurable FEC types: SDFEC2, HFEC PLUS. In a coherent network, the recommended modulation format for the TxA module is QPSK.
In a wDCM network, the modulation format can only be QPSK wDCM for the TxA module. The QPSK and QPSK wDCM modulation formats cannot interconnect with each other.

(<https://actfornet.com/store/tn18lsc-osn8800-optical-transponder-unit.html>).

FEC is a part of auto-negotiation on an interface. If auto-negotiation is enabled on an interface, the local and remote interfaces negotiate to enable or disable FEC. If auto-negotiation is disabled on an interface, the default FEC mode is used. You can configure RS-FEC, Base-R FEC, or none FEC (disabling FEC) on an interface based on the interface's support for FEC. If FEC is enabled at one end of a link, this function must also be enabled at the other end of the link. If both a 25GE interface on the device and the remote interface support Base-R FEC and RS-FEC, the interfaces work in RS-FEC mode when they work in auto-negotiation mode.

When the negotiation status of interfaces at both ends of a link is not affected, pay attention to the following points:

- When the QSFP28-100G-LR4 optical module is used, the FEC function is disabled by default according to IEEE 802.3.
- When a QSFP-100G-ER4-Lite optical module is used, the FEC function is enabled by default. When a QSFP-100G-ER4-Lite optical module is connected to a standard 100GBASE-ER4 optical module (such as CFP-100G-ER4 and CFP2-100G-ER4), the FEC function needs to be disabled.
- When other QSFP28 optical modules excluding the QSFP28-100G-LR4 are used, the FEC function is enabled by default. Do not disable the FEC function; otherwise, error packets may be generated.

If an interface has been configured as a stack member interface, the FEC configuration command cannot be run on the interface. Similarly, if the FEC configuration command has been run on an interface, the interface cannot be configured as a stack member interface.



(<https://support.huawei.com/enterprise/en/doc/EDOC1100137939/246e8ff0/configuring-fec>).

### NOTE

- The default FEC mode on an interface varies according to the device model and connection medium. Interfaces at both ends of a link must work in the same FEC mode; otherwise, the interfaces do not go Up. If their FEC modes are different, configure the same FEC mode on the interfaces when they work in non-auto-negotiation mode. You can run the **display interface** command in any view or the **display this interface** command in the interface view to check whether the FEC function is enabled on an interface based on the **Fec** field in the command output.
- The FEC mode can be changed without the need to disable auto-negotiation on 100GE interfaces of the CE8860EI only when 100GE copper cables are installed on the interfaces. For 25GE interfaces of the CE8860EI and other switches excluding the CE8860EI, FEC mode can be changed only after auto-negotiation is disabled.
- When 25GE interfaces are interconnected, you are advised to enable FEC at both ends of the link to reduce the transmission bit error rate of the physical link. Otherwise, error packets may be generated.

(<https://support.huawei.com/enterprise/en/doc/EDOC1100137939/246e8ff0/configuring-fec>).

The OptiX OSN 9800 U series is a next-generation OTN product that features large capacity, ASON, and the integration of OTN and packet functions. Mainly deployed on super networks and regional networks, it is the best 200G/400G OTN platform in the industry.

Based on the industry-leading T-bit universal switching chip, the platform supports OTN, Virtual Circuit (VC) and Partition Knowledge Table (PKT). Its high integration and modular design enable service access from 100M to 100 Gigabit Ethernet (GE) and transmission of 100G/200G/400G per lambda that can be seamlessly expanded to 1T/2T. Integrated with Multiprotocol Label Switching – Transport Profile (MPLS-TP) this product is capable of facing the challenges brought about by the explosive growth of the cloud era.

(<https://support.huawei.com/enterprise/en/optical-transmission/optix-osn-9800-u16-pid-21110042/doc>).

**No.:** EOM-TA-2019-035-Global  
**Date:** December 31,2019

Dear Customers,

To help you better cope with challenges brought by market changes and technological innovations, Huawei hereby informs you of the milestones in the life cycle of OptiX OSN 9800 U16 V100R006C00,OptiX OSN 9800 U32 V100R006C00,OptiX OSN 9800 U64 V100R006C00,OptiX OSN 9800 UPS V100R006C00,OSN9800 M24 V100R006C00 release. Hopefully this information can give you a reference on making future network development plans.

Huawei product lifecycle milestones are defined as follows:

Milestone	Definition
EOM	End of Marketing. The EOM date is the date when the product stops accepting orders, including orders for new sites and capacity expansion. After that date, the product will no longer be sold.
EOFS	End of Full Support. After the EOFS, Huawei will not provide the full support service for the product. Between EOFS and EOS, Huawei will support fewer service categories and offer lower service levels and SLAs, and no longer develop patches for new network problems, support software upgrades, or provide spare parts using original part numbers. Regarding released patches, Huawei will still provide the uploading service for customers.
EOS	End of Service & Support. It refers to the last date of the service. After the EOS date, Huawei does not provide any service for the product.

**Table 1 EOX release lifecycle milestone**

Release name	Milestone		
	EOM	EOFS	EOS
OptiX OSN 9800 U16 V100R006C00	2020-06-30	2021-06-30	2021-12-31
OptiX OSN 9800 U32 V100R006C00	2020-06-30	2021-06-30	2021-12-31
OptiX OSN 9800 U64 V100R006C00	2020-06-30	2021-06-30	2021-12-31
OptiX OSN 9800 UPS V100R006C00	2020-06-30	2021-06-30	2021-12-31
OSN9800 M24 V100R006C00	2020-06-30	2021-06-30	2021-12-31

(<https://support.huawei.com/enterprise/en/bulletins-product/ENews2000006137>); *see also*

(<https://support.huawei.com/enterprise/en/bulletins-product/ENews2000002993>).

243. On information and belief, Huawei has directly infringed and continues to directly infringe method claim 14 of the '249 patent pursuant to 35 U.S.C. § 271(a), literally or under the doctrine of equivalents, by using, selling, offering to sell, and importing into the United States the Accused Pluggable Products, on or after the issuance date of the patent.

244. Huawei has been, and currently is, indirectly infringing method claim 14 of the '249 patent by inducing infringement under 35 U.S.C. § 271(b) and as a contributory infringer

under 35 U.S.C. § 271(c). For example, Huawei has proceeded to actively induce infringement of the '249 Patent under 35 U.S.C. § 271(b) by: inducing customers and/or other third parties to make, use, sell, offer for sale, market, advertise, and/or import the Accused Pluggable Products that infringe the '249 Patent. Further, Hauwei by disseminating marketing materials, providing user and technical manuals relating to the Accused Pluggable Products to customers and others, and by other acts have actively induced infringement by encouraging such third parties to directly infringe the '249 Patent such as by ISPs and others using Accused Pluggable Products in this District and elsewhere in the United States and by the users of Accused Pluggable Products using such products in this District and elsewhere in the United States in ways that directly infringe the '249 Patent. Huawei knew or should have known that the acts they induced constituted patent infringement. Additionally, Huawei has indirectly infringed, and continues to indirectly infringe the '249 Patent under 35 U.S.C. § 271(c) by materially contributing to infringement of the '249 Patent by making, using, selling, offering for sale, advertising, marketing, and/or importing the Accused Pluggable Products, which infringe the '249 Patent, and by instructing those others to infringe the '249 Patent, as described in detail above. On information and belief, Huawei engaged in such activities despite an objectively high likelihood that their actions constituted infringement of valid patents, including the '249 Patent. Huawei knew and should have known that their actions would cause direct and indirect infringement of the '249 Patent. Huawei also contributes to the foregoing infringement by customers by offering to sell, selling, and importing in the United States the Accused Pluggable products that constitute all or a material part of the articles that practice the '249 Patent. Huawei knows, or should have known, that such Huawei products have no substantial non-infringing uses, are a material part of the invention of the '249 Patent, especially made or especially adapted for

use in an infringement of such '249 Patent and is not a staple article or commodity of commerce suitable for substantial non-infringing use.

245. Huawei knew of the '249 patent or should have known of the '249 patent, at least because the '249 patent's priority document, EP2071861B1, was identified and cited during the prosecution of Huawei's U.S. Patent No. 10,128,970. Moreover, ADVA informed Huawei on November 17, 2022 that the 249 Patent is relevant to Huawei's OTN and DC products. Thus, Huawei has had knowledge that the Accused Pluggable Products infringe the '249 patent since well-before this complaint was filed. Huawei has also had actual knowledge of the '249 patent since at least the filing of this complaint.

246. Additional allegations regarding Huawei's knowledge of the '249 patent will likely have further evidentiary support after a reasonable opportunity for discovery.

247. ADVA is entitled to recover from Huawei all damages that ADVA has sustained as a result of Huawei's infringement of the '249 patent, including without limitation lost profits and no less than a reasonable royalty.

#### **PRAYER FOR RELIEF**

WHEREFORE, ADVA respectfully requests that this Court enter judgment in its favor as follows and award ADVA the following relief:

- (a) Enter judgment in favor of ADVA.
- (b) Adjudge and decree that Huawei is liable for breach of its contractual commitments to the ITU-T by failing to offer FRAND terms and conditions for a license to Huawei's patents identified in the Complaint and its OTN and DC SEPs to ADVA;
- (c) Adjudge and decree that ADVA and all of its worldwide affiliates are entitled to a license from Huawei for Huawei's patents identified in the Complaint, as well as any and all

patents deemed “essential” or that Huawei deems “essential” and/or has declared “essential” to the OTN and DC standards under FRAND terms and conditions that are free from discrimination pursuant to Huawei’s obligations to the ITU-T;

(d) Adjudge, set, and decree the FRAND terms and conditions to which ADVA is entitled under Huawei’s obligations to the ITU-T for a license to Huawei’s patents identified in the Complaint and its OTN and DC SEPs deemed essential to an ITU-T standard, so that ADVA may obtain a FRAND license on those terms, and compel specific performance of Huawei’s obligations;

(e) Adjudge and decree that Huawei has not offered a license to Huawei’s patents identified in the Complaint and its OTN and DC SEPs to ADVA on FRAND terms and conditions;

(f) Enjoin Huawei from demanding excessive royalties from ADVA that are not consistent with Huawei’s FRAND obligations to the ITU-T;

(g) Enjoin Huawei from enforcing its ITU-T SEPs against ADVA and its customers via patent infringement lawsuits or other proceedings in other jurisdictions, while ADVA remains a willing licensee and seeks an adjudication of the FRAND terms and conditions from this Court;

(h) Adjudge and decree that the ’462 patent is not essential to the ITU-T standards, and that ADVA does not and has not infringed the ’462 patent;

(i) Adjudge and decree that the ’571 patent is not essential to the ITU-T standards, and that ADVA does not and has not infringed the ’571 patent;

(j) Adjudge and decree that the ’973 patent is not essential to the ITU-T standards, and that ADVA does not and has not infringed the ’973 patent;

(k) Adjudge and decree that the ’728 patent is not essential to the ITU-T standards, and that ADVA does not and has not infringed the ’728 patent;

- (l) Adjudge and decree that the '907 patent is not essential to the ITU-T standards, and that ADVA does not and has not infringed the '907 patent;
- (m) Adjudge and decree that Huawei is liable for infringement, contributing to the infringement, and/or inducing the infringement of one or more claims of the ADVA asserted patent, as alleged herein;
- (n) An award of damages adequate to compensate ADVA for the infringement that has occurred, pursuant to 35 U.S.C. § 284, including prejudgment and post-judgment interest;
- (o) Enter judgment awarding ADVA its expenses, costs, and attorneys' fees under applicable laws; and
- (p) For such other and further relief as the Court deems just and proper.

Dated: May 8, 2023

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